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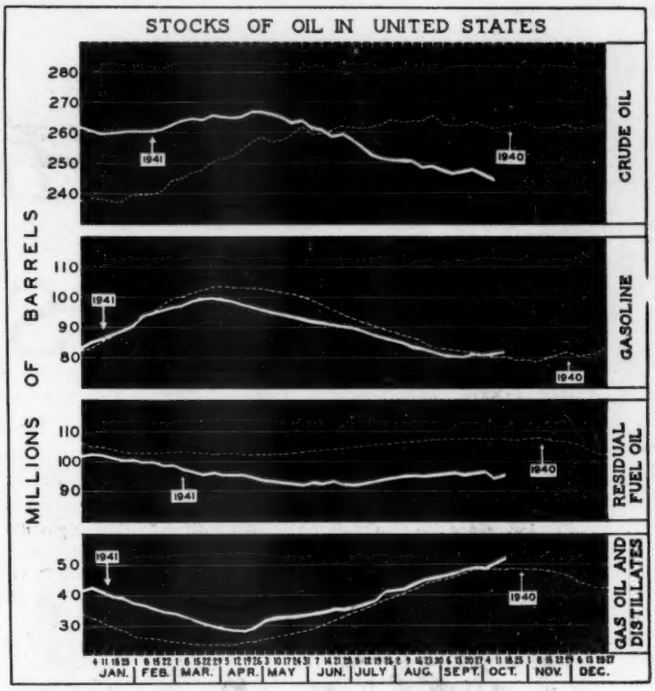
Trends

Operators Want Price Balanced Against Demands



OIL operators at several meetings held during the past week listened to reports from economists within the industry and from government representatives which showed that the recent peaks in crude-oil production and in refinery and transportation operations would continue over the next several months with still higher operating levels assured for next year. Predictions that domestic crude-oil needs would jump to a peak of 4,500,000 bbl. daily by next summer were heard, with 460 refineries running approximately 4,350,000 bbl. daily of crude oil to their stills.

CRUDE PRODUCTION *4,117,475 bbl. daily average—up 32,975 bbl. One year ago 3,668,230 bbl.*

CRUDE STOCKS *243,571,000 bbl. as of October 11 — down 2,573,000 bbl. One year ago 263,425,000 bbl.*

GASOLINE STOCKS **82,584,000 bbl. as of October 18 — up 1,203,000 bbl. One year ago 80,414,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *95,800,000 bbl. as of October 18—up 273,000 bbl. One year ago 107,236,000 bbl.*

GAS OIL AND DISTILLATES *52,403,000 bbl. as of October 18—up 1,114,000 bbl. One year ago 48,943,000 bbl.*

REFINERY RUNS *4,120,000 bbl. daily week ended October 18 — up 45,000 bbl. One year ago 3,525,000 bbl.*

*Includes 7,236,000 bbl. aviation motor fuel, down 86,000 bbl. One year ago 6,127,000 bbl.

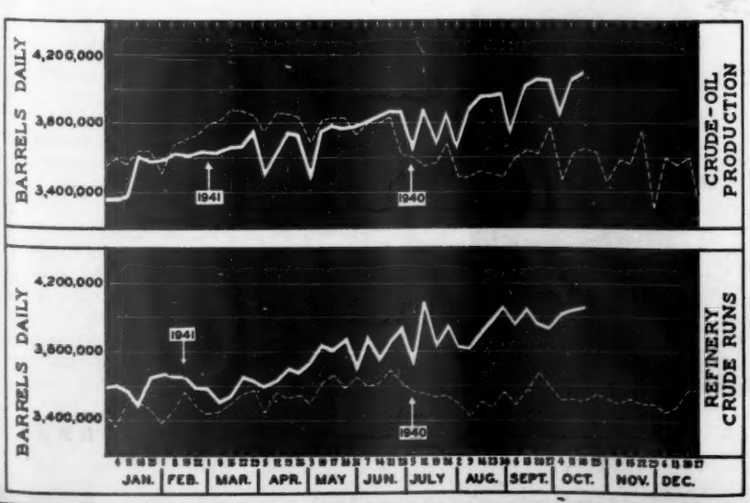
Along with these predictions as to demands came statements from authoritative sources that the domestic industry so far this year had not found as much crude oil as it had produced and in view of large requirements for the next 12 months, proven oil reserves in terms of years' supplies are now the lowest since the late 'twenties. Producers were urged to expand their exploratory operations and find more oil to correct this situation, which, it was pointed out, threatened the oil industry's full-scale support of the defense program. While there are those who do not subscribe to all the statements that have been made, predictions as to future demands were not challenged. All divisions must now prepare to operate at levels exceeding predictions of 6 months or a year ago.

Many operators in informal discussions at the meetings were frank in their opinions of market conditions in relation to these expanded operations. Data were offered to show that operators will not be justified in expanding their exploratory work to uncover new reserves at present posted schedules for crude oils.

Market conditions as they apply to refinery and bulk-station operations are equally unsatisfactory to many companies. It is felt that refinery prices have been frozen without justification due to the attitude of the federal price administration. In some cases, ceilings have been established by the price administrator and in other situations, sellers have not made needed advances because they feared the increases would be objected to at Washington. Several incongruous phases of the industry's present market conditions are explained in support of the contention that something needs to be done quickly. One of the situations applies to lease-lend sales at the Gulf Coast. This business generally is being placed at higher price levels than the tops established by the price administration. In some instances sellers have disposed of their output at prices in line with the price administrator's recommendations and now find they cannot participate in the lend-lease business.

DAILY AVERAGE PRODUCTION FOR WEEK

	Oct. 18, 1941	Bur. Mines Oct. est. of demand	October state allowables	Oct. 11, 1941
Arkansas	71,845	78,200	73,400	71,230
California	664,150	613,200	613,200	662,750
Eastern fields	113,500	118,200	.....	113,500
Illinois	420,615	399,200	.....	421,500
Kansas	259,800	253,000	256,500	231,650
Louisiana	345,505	332,000	339,233	336,285
North Louisiana	*80,155*	.....	.....	*80,085*
Louisiana Gulf Coast	*265,350*	.....	.....	*256,200*
Michigan	57,800	44,100	48,000	57,600
Mississippi	64,130	43,900	.....	62,135
Nebraska	7,200	5,300	.....	6,950
New Mexico	115,840	114,600	114,000	114,650
Oklahoma	418,250	481,500	428,000	428,100
Rocky Mountain states	113,140	109,600	.....	114,500
Texas	1,465,700	1,420,100	1,485,966	1,463,650
East Texas	*369,900*	.....	.....	*369,700*
West Texas	*282,850*	.....	.....	*279,700*
North Central Texas	*135,750*	.....	.....	*134,700*
East Central Texas	*85,450*	.....	.....	*83,500*
Texas Panhandle	*80,400*	.....	.....	*84,400*
Texas Gulf Coast	*415,400*	.....	.....	*416,700*
Southwest Texas	*95,950*	.....	.....	*94,950*
Total United States	4,117,475	4,012,900	.....	4,084,500
Total production, Jan. 1-Oct. 18, 1941		1,092,220,970 bbl.		
Same period last year		1,079,313,105 bbl.		



Steel and Higher Prices Are Needed to Spur Industry

By H. STANLEY NORMAN
and HARRY F. SIMONS

HIGHER prices for crude oil commensurate with rising operating costs and a system of rationing steel and other metals that will permit the petroleum industry to fulfill its emergency obligations were the two main objectives outlined here this week by the Independent Petroleum Association of America in its twelfth annual meeting. Part of the course leading to the two goals was charted by executives of the association and by speakers from high posts in the industry and in state and federal government.

Hundreds of oil men from all sections of the country registered for the 3-day meeting attested to the scope of interest this year in deliberations of the association. Utterances of the speakers reviewing recent events and forecasting those in prospect marked this year's annual meeting as the most critical in the history of the association.

Right: Wirt Franklin, senior director and director of production District 2; Frank Buttram, Oklahoma City, Okla., president of I.P.A.A.; John B. Cowden, Clark & Cowden Drilling Corp., Dallas, Tex., and Walter Goldston, Jr., producer, Houston, Tex. Below: J. F. O'Shaughnessy, Lario Oil & Gas Co., Wichita, Kans., and A. A. Seeligson, producer, San Antonio, Tex.

Assurances that steel for exploratory operations will receive first consideration from the Office of Petroleum Coordinator were given during the meeting by Ralph K. Davies, deputy coordinator, Robert E. Allen, director of production, and by Wirt Franklin, director of production and senior director of District 2. These men were less certain about the industry's ability to procure steel for routine drilling in proven fields and were downright discouraging over the prospects of securing supplies for "unnecessary" wells. Rep. William P. Cole, Jr., of Maryland, and Gov. Leon C. Phillips, of Oklahoma, were among the other government officials addressing the meetings.

A plea that steel and other materials be rationed within the oil industry on a basis of the total amount existing in the nation and not merely on what is left after some have filled their warehouses was made by Frank Buttram, Oklahoma City, Okla., president of the association who was reelected for a third term. Mr. Buttram's acceptance of another year in office was a compromise of his previous decision but strong factions in the independent ranks of the industry prevailed.

Mr. Buttram, after asserting that unexpected and sweeping changes in the petroleum industry's methods of operation had been called for by war emergency, said that the industry's job is one which it alone can do. The petroleum industry, he said, was geared to peacetime conditions, with a large margin for safety's sake, but emergency conditions have called for emergency methods. Referring to practical aspects of the oil industry's role in the emergency program, Mr. Buttram said that in all practical ways the operators should be given the materials with which to maintain production and to explore for new reserves. "There must be," he said, "insistence upon equity in the allocation of such materials."

Right: H. M. McClure, independent producer of Alma, Mich., chairman of the National Stripper Well Association resolutions committee

Production Stimulation Needed

Measured by any standard that is generally accepted, Mr. Buttram went on, the price of crude oil is below what it must be if the industry is to produce the amount needed and have the necessary margin for exploring for and developing new fields vital to replacement of the oil that is being consumed at a unprecedented rate.

Mr. Buttram, H. B. Fell, executive vice president, and Russell B. Brown, general counsel, all referred to the necessity of restricting imports to a reasonable rate and asked that the excise-tax concessions be eliminated. Procurement of essential information upon which the oil industry could base its operating program during the war-emergency period was urged by Mr. Fell. Among

other points on which more exact data are needed than is now available, Mr. Fell listed: Rate of sustained production that could be maintained for 1 year without waste of reservoir energy; quantity of oil that can be produced, ultimately, from known fields by present methods; estimated demand for petroleum for each of the next 3 years; quantity of oil that must be discovered annually for 2 or 3 years; quantity of oil that must be discovered annually for 2 or 3 years to maintain present reserves; drilling required to maintain reserves and meet demand; price necessary to effect the required development; probable amount of equipment needed to produce from existing wells and drill new ones.

Many of the topics discussed before the I.P.A.A. meetings overlapped with subjects presented before the National Stripper Well Association sessions Monday. A major point made before both groups was the necessity for crude prices that would justify the continued operation of low-yield properties. Otherwise, many speakers cautioned, premature abandonment of wells for the sake of salvaging equipment for use in more prolific properties would unbalance the production end of the business and cause a shortage in production.

Davies Banquet Speaker

Mr. Davies, main speaker at the banquet Tuesday night at which Paul G. Blazer, president, Ashland Oil & Refining Co., Ashland, Ky., presided, emphasized the OPC attitude favoring unrestricted and expanded exploration. He called attention to the coordinator's efforts to clarify the equipment-procurement difficulties and reasserted that the most vital requirements of the industry, correlated with emergency demands, are receiving the first consideration out of absolute necessity.

petroleum reserves in the ground becomes a constantly more important factor in the mission of the country's armed forces to provide properly for the defense of the nation and its outlying possessions, when we realize the large increase in the tonnage of the Navy, the larger air forces in both the Army and Navy, and the tendency for complete mechanization of various Army units to increase their mobility and effectiveness."

Earlier, Representative Cole reminded his audience of the fight made against the control measure he favored in 1935.

Most of the association detailed work was handled again this year through functional committees, which were either considering the problems specifically assigned to them or reporting their conclusions throughout the week.

W. G. Skelly, president of Skelly Oil Co., Tulsa, spoke at the concluding luncheon session Wednesday, after which the delegates left Tulsa for Woolaroc ranch at Bartlesville, Okla., where Frank Phillips, chairman of Phillips Petroleum Co. and general director of District 2 in the OPC organization, was host for the afternoon and evening.

Right: C. P. McGaha, Wichita Falls, Tex., reelected president of the National Stripper Well Association, and H. B. Fell, Ardmore, Okla., executive vice president of both the stripper association and the I.P.A.A. Below: H. S. Moss, Dallas, Tex., independent producer, conferring with John M. Lovejoy, president Seaboard Oil Co. of Delaware

Below, left: Ralph T. Zook, Bradford, Pa., vice president of both associations for Pennsylvania, and C. A. Johnson, Los Angeles, Calif., vice president for his state. Below, right: William D. Flynn, Artesia, N. M., and Robinson, Ill., independent producer, and Lee Mulvihill, Robinson, Ill., secretary of the Illinois Independent Producers Association

Congressman Cole, speaking at the Tuesday noon luncheon, paid tribute to the interstate oil compact and declared that he believes this document is of far greater importance in the life of the petroleum industry than some appreciate. He congratulated the industry on conservation work accomplished through state regulatory bodies and on a voluntary basis, although he holds that the law proposed over his name in 1935 had certain advantages that are not permitted in the current situation.

"Your industry," declared Congressman Cole, who is the author of the Pipe Line Act giving interstate carriers right of eminent domain, "is the second largest in our nation. The uses by everyone of the innumerable products it produces are many and tremendously important. The necessity for our Government to possess adequate

Interests of the Independent Petroleum Association of America and the National Stripper Well Association are so closely related that the two groups held their annual meetings simultaneously this year. A report on the stripper association meeting held Monday while I.P.A.A. committees were completing their discussions and writing conclusions starts on Page 16. This meeting featured the priorities question and answer period conducted by Robert E. Allen, the addresses of Wirt Franklin, Burdette Blue and J. C. Watson.

SALVAGING OF PIPE BECAME A MAJOR ISSUE THIS WEEK IN THE OIL INDUSTRY. OPERATORS WANT HIGHER CRUDE PRICES TO PREVENT PREMATURE ABANDONMENT OF SMALL WELLS, SOME OF WHICH ARE BEING PLUGGED TO OBTAIN PIPE FOR MORE PROLIFIC AREAS

This Week...

Amendment to Preference Rating Order P-22, extending a limited blanket priority rating of A-10 to petroleum industry repair and maintenance materials, will be followed shortly with provision for securing supplies for other purposes.

●

OPM is still casting side glances at large inventories of metals . . . may act to redistribute unreasonably large supplies.

●

Supply companies, so reports say, are finding Preference Rating Order M-21-b and its supplements helpful in maintaining warehouse stocks.

●

Oil men are using preference ratings on specified materials as collateral in borrowing an equal amount of the same supplies from inventories of warehouses or neighbor operators, repaying with the new shipment when it arrives.

●

Maximum production short of a rate physically wasteful is advocated for Texas fields by Col. Ernest O. Thompson, railroad commissioner, who enjoys periodical leaves from duties in the U. S. Army.

●

The Bureau of Mines forecast for domestic crude required in November was fixed Tuesday at 4,070,000 bbl. daily, an increase of 57,100 bbl. over the October estimate.

●

Preliminary plans for doubling 100-octane-gasoline capacity were discussed by district refinery committees' chairmen and the OPC refinery director at Washington, D. C. Proposal gaining momentum for creation of government agency to purchase 3-year production of this fuel. Refiners would be more willing participants with this assured market.

●

Petroleum distributors may find their contracts with supplying refiners practically valueless. Navy authorities are urging refiners to fill lend-lease business out of inventories held against shipping instructions from contract customers. So far, only moral suasion has been used.

●

High priority rating was assigned seven refineries for construction of facilities to recover fractions for blending or conversion into 100-octane gasoline. Similar facilities are now under construction at eight other refineries. A production deficiency of 39,000 bbl. daily below consumption is anticipated by January 1, 1942.

●

Oil companies in District 1 used 4,322 tank cars to move crude and refined products to the East Coast, an average of 617 cars daily, the largest number engaged in this service since the emergency developed.

●

Robert E. Allen, director of production, OPC, reported to the National Stripper Well Association that 700,000,000 bbl. of new reserves are necessary for each increase of 100,000 bbl. in daily production. November's forecast means someone should find 350,000,000 bbl. of new oil in short order.

●

Wirt Franklin, senior director in charge of production for District 2, indicated before the I.P.A.A., that spacing programs of one well to 40 acres or more would be likely to receive most favorable consideration by the petroleum coordinator.

●

Domestic production moved up to another all-time peak, averaging 4,117,475 bbl. daily. Cumulative recovery for this year is now nearly 13 million barrels ahead of the same time in 1940.

Crude Raise Needed to Save Strippers

PRICE, priorities, and federal control shared the spotlight at the seventh annual meeting of the National Stripper Well Association held in Tulsa Monday. The priorities portion of the program was not scheduled but was arranged as a question-and-answer session when it was learned that Robert E. Allen, director of production, Office of Petroleum Coordinator, would be present.

Mr. Allen made no formal speech or introductory remarks but merely invited the oil and supply men present to ask any questions which were not settled in their minds. The answers to many of the questions indicated to a certain extent what was in the minds of OPC and OPM officials concerning the oil industry and its part in national defense. His statement that a general and more favorable rating for the oil industry might be in the offing was of interest to those present.

A preference rating for the entire petroleum industry's supply requirements, covering equipment needed for new work and expansion, phases of operations specifically excluded from the repair and maintenance order P-22, may be issued by the Office of Production Management within the next 10 days or 2 weeks. Probability that such action will be taken by OPM was outlined by Mr.

(Continued on Page 102)

NEXT WEEK

You will want to see

The California Issue

Containing:

- Color maps on the five principal oil and gas-producing districts of the state, accompanied by tables on the production and geology of each field.
- A complete history of the Pacific Coast petroleum industry from its inception in 1866 to the end of October 1941, with illustrations.
- Comprehensive review of California petroleum-engineering practices, dealing with all recent developments in drilling and production.
- Complete breakdown of reserves showing current production, cumulative recovery and oil remaining in each important field.
- Histories of companies prominent in the state's petroleum development.
- Review of current refinery operations.

Speakers' table during the meeting of the Interstate Oil Compact Commission at Fort Worth, Tex., October 16-17. Left to right: H. M. Morse, Mississippi; E. J. Sullivan, Wyoming; Warwick Downing, Colorado; Tom Anglin, Oklahoma; P. J. Hoffmaster, Michigan; O. C. Bailey, Arkansas; W. J. Holloway, Oklahoma; Clarence T. Smith, Illinois; Andrew F. Schoeppel, Kansas; J. C. Hunter, Texas; A. G. White, Bureau of Mines, speaking; Gov. John E. Miles, New Mexico; Parker Melvin, Pennsylvania; Glenn Johnson, Oklahoma; Theo Morgan, Kansas; Earl Foster, Oklahoma; Hiram M. Dow, New Mexico; W. J. Armstrong, Oklahoma; Olin Culberson, Texas Railroad Commission. In the foreground: Left, T. C. Knoop, Jr., assistant secretary, and Charles L. Orr, secretary, Interstate Oil Compact Commission

Compact Members Told New Records in Demand Assured

By C. O. WILLSON

FORT WORTH, Tex., Oct. 16.—Members of the Interstate Oil Compact Commission today in sessions which were also attended by more than 300 oil men from all parts of the United States, were told in prepared addresses that the petroleum industry in this country over the remainder of the year and through 1942 will be expected to provide more petroleum than ever before. They were given more encouraging reports than they have had in recent weeks as to the materials and equipment that will be made available to carry on these operations but were warned at the same time that operators cooperating with the state regulatory bodies will be expected to "obtain more and more oil from less and less materials."

The meeting, which opened with committee sessions yesterday, was the first to be held since the recent 2-year extension to the compact brought about through action of Congress and the president following approval of most of the oil states. Representatives of 11 oil states as members, the largest number in the 6-year history of the compact, were present and participated in the discussions.

The states and their official representatives at the meeting were: Arkansas, O. C. Bailey; Colorado, Warwick M. Downing; Illinois, Clarence Smith; Kansas, Andrew M. Schoeppel; Louisiana, Gov. Sam Jones; Michigan, P. J. Hoffmaster; New Mexico, Hiram M. Dow; New York, Harold Ostertag; Oklahoma, W. J. Holloway and Tom Anglin, representing Gov. Leon C. Phillips; Pennsylvania, Parker Melvin, and Texas, J. C. Hunter. All representatives are active in the oil-conservation work of their states and in most instances were accompanied by members of the state conservation staffs and other state officials. Mr. Schoeppel, first vice chairman of the Compact Commission, presided at the meetings in the absence of Governor Phillips who has been chairman of the compact over the past 2 years.

Three Governors Present

Governors of three oil states were present. Gov. Coke Stevenson, who became Texas' chief executive in August and who was attending his first compact meeting, welcomed the compact representatives and oil men. Gov. John E. Miles, of New Mexico, who has taken an active interest in his state's oil-conservation program, responded to the welcome. Gov. Sam Jones, of Louisiana, whose state is one of the new members of the compact, stressed the necessity of educating the general public regarding the advantages that accrue to consumers through the application of sound conservation principles in oil development.

The commission adopted a resolution presented by Maj. B. A. Hardey, of Shreveport, chairman of the Louisiana Board of Minerals, which stated in part: "The commission recognizes the fact that an aggressive program of development in the search for new oil and gas reserves is necessary to augment the present known reserves so that the extraordinary demand being made by national defense can be adequately taken care of. In order that this might be accomplished it is imperative that no undue restrictions be imposed on the industry by governmental authorities. In this connection it is important that the present threatened shortage of equipment and supplies be eliminated by issuance of favorable priority ratings on such equipment. No restrictions or burdens, economic or otherwise, should be imposed on the industry at this time which would cause the premature abandonment of small stripper wells and the consequent loss of these reserves. The commission urges close cooperation between the industry and all governmental agencies toward the end that the extraordinary demands occasioned by the present emergency shall be adequately met."

Mr. Downing, of Colorado, veteran member of the compact, at the conclusion of a well-received address in which he stressed the necessity of assuring adequate returns to operators in finding the new reserves to take care of expanding future needs, asked the commission to go on record in favor of higher prices for crude oil and products and against the placing of price ceilings. In another resolution he asked that Petroleum Coordinator Ickes make "a full and frank statement of the understanding of his position as coordinator to the end that all may be assured that his office is one of coordination and not one to administer either state laws or regulations issued by state conservation bodies." The resolution also asked the federal coordinator to give assurance that his petroleum organization would be discontinued at the close of the present emergency. Neither of the Downing resolutions was approved by the commission which held an executive session at the close of the afternoon meeting.

Action on several matters including additions to the commission's staff was postponed until

(Continued on Page 101)

COMPACT-MEETING HIGH POINTS

- **Present demands of more than 4 billion barrels daily for domestic crude oils will continue over remainder of year with 6 to 7 per cent gains in prospect for 1942. Upward trends in exports will continue.**
- **Recent crude-oil production has exceeded additions to proven reserves brought about by new discoveries and an expanded exploration program is necessary to assure adequate supplies in the future.**
- **Position of petroleum industry in regard to materials to carry on its operations is improving.**
- **No undue extension of federal powers justified with state regulatory bodies and the interstate oil compact competent to carry out needed conservation regulations.**

Refiners Hear Papers on Priorities and Economics

By R. MARNE SANFORD

SHREVEPORT, La., Oct. 21. — The second regional meeting of the Western Petroleum Refiners Association was held here last Friday at the Washington-Youree Hotel.

The subjects covered by the three speakers included types of steel and steel alloys for refinery construction, various ways and means of cutting refinery costs and overhead, and new and improved types of products finished by the refineries. All subjects, however, stressed the mounting importance of obtaining the greatest and most economical returns from refineries in view of growing needs for more and better finished products brought about by national defense.

Some 75 refiners and refinery operating men attended the session and all participated in the discussions, both during the delivery of the papers and during the following informal comment period. The three topics discussed were not formally drawn up into research-paper form, but were presented most informally by their exponents.

Speakers and chairman of the Shreveport meeting of the Western Petroleum Refiners Association: A. F. Zoll, National Tube Co., Ellwood City, Pa.; L. A. Mekler, Universal Oil Products Co., Chicago, Ill.; Dr. E. R. Smoley, Lummus Co., New York, and J. K. MacKinnon, Western Petroleum Refiners Association, one of the chairmen

Use of Alloy Steels

Opening the meeting Friday morning, A. F. Zoll, National Tube Co., Ellwood City, Pa., presented a discussion of the problem of acquiring steel under the present priority system prompted by the national-defense program. He also discussed the types of steel now available for refiners under the priority system.

Discussion from the floor posed a problem not brought about by the priority system. Mr. Zoll stated when questioned that the steel industry had not yet been able to develop a tube resistant to corrosion from both chlorides and sulfides. "Chloride corrosion-resistant tubes have not yet been developed mainly because steel research engineers do not know just what this corrosive action consists of, therefore tests in the laboratory cannot be made to detect them," stated Mr. Zoll.

"In one respect," he later cited, "the priority system has materially aided the delivery of refinery building materials." This was explained by the fact that almost any refinery which can produce high-octane gasoline or such products needed in the national-defense program, will receive more than average speed in delivery of material, provided the refinery can prove that with this material needed fuels can be turned out. Following the presentation of the subject, Mr. Zoll presented a moving picture entitled, "Walls Without Seams." This traced the making of seamless casing and tubing from the iron-ore deposits in the Great Lakes region, to the smelter, through the production stages, and to the finished products.

Dr. E. R. Smoley, Lummus Co., New York, in opening the afternoon session of the meeting, stated that "About a year ago 11 polyform and gas-reversion processes plants were in operation and at present there are 14 active and 4 more in the construction state." The increasing number of plants of this type, he further pointed out, in the past year serves as a merit of the process. Dr. Smoley first presented slides showing how octane numbers of premium-grade, regular, and third-grade gasolines had been increased from the period of 1936 to the present date. An octane number of 81 for premium-grade gasoline, 74.5 for regular and 65.7 for third grade was shown as an average for the entire country for the winter of 1940-41.

Besides finishing high-octane gasoline, it was pointed out that butane-isobutane cuts from polyform plants can be made and these cuts are feed stock to aviation-alkylation plants. Also from polyform gasoline a base aviation gasoline which can be leaded up to 91 octane with less than 4 cc. can be made. This product, in turn, can be blended with isobutane and aviation-alkylation products with the addition of only 3 cc. of lead to make 100-octane gasoline meeting all requirements of the Army and Navy.

To finish the discussion of the polyform-process plant, Dr. Smoley presented a moving picture of the construction of a plant of this type tracing the work from the laying of the foundations to the finished refinery.

Economics of Refinery Fuel

"Fuel economics in modern petroleum refining is a new headache to refiners since it is possible to lose more money trying to economize on fuel that to disregard the entire problem," stated L. A. Mekler, Universal Oil Products Co., Chicago, in discussing the problem of refinery fuel, in the final paper. He pointed out that nonsoluble residues are now about gone from the refining process but some are still burned. It was cited that the modern refiner now has to burn something that he has to buy or something that he could sell.

It was shown by means of slides based on research by the U. S. Bureau of Mines that from 1927 to 1939 nonmarketable products had declined sharply. In a remedial nature relative to this problem, Mr. Mekler stated that one way to save was to burn fuel properly and blend properly to get, respectively, the greatest B.t.u. value from the fuel and to maintain the highest quality thereof.

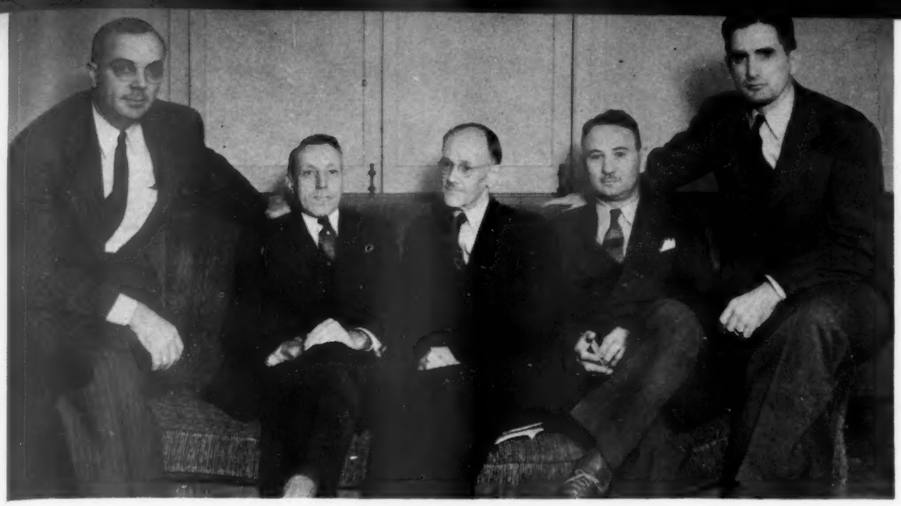
Slides were shown presenting two types of air preheaters which would materially cut down the loss of heat. One was the recuperative heater which could be designed to operate with an L-type flow or a crossflow, dependent upon refinery conditions. The other type was the regenerative heater of which the stationary form finds main use in steel furnaces and smelters, while the rotary form finds greatest use in the refining industry. Some discussion from the floor was presented upon the feasibility of installing either natural-draft preheaters or induced-draft preheaters, dependent upon the size of the plant and the desired performance.

In concluding the discussion of refinery fuel the process of generation of steam was cited as another means of economy. It was emphasized that with the advance in modern thermal processes which employ increased temperature and pressure levels and also in modern catalytic processes, the removal of large amounts of excess heat existing in the system can be accomplished by using this heat for generation of steam. This offers a simple, flexible, and economical solution to the refiner, especially when the cooling water and steam are not satisfactory. In conclusion, Mr. Mekler stated that fuel was scarce these days and the installation of some type of heat-saving equipment offered the best solution to the problem.

After the adjournment of the meeting, a smoker was held for the refiners in attendance, which was sponsored by a group of equipment-supply manufacturers. This same group also was host to a very enjoyable luncheon held in the Zephyr Room of the hotel during the noon intermission of the meeting.

The entire Shreveport meeting was under the very able supervision of L. C. Grosjean, formerly director of the Louisiana and Arkansas branch of the association, and now stationed at Tulsa.

The equipment manufacturers who sponsored the entertainment for the refiners were the following: American Cast Iron Pipe Co., J. B. Beaird Corp., Bethlehem Supply Co., Crane Co., Ingersoll-Rand Co., Johns-Manville Co., A. M. Lockett & Co., National Tube Co., Pittsburgh-Des Moines Steel Co., Steel Tank Construction Co., and Westcott & Greis, Inc.



Left: C. B. Carpenter, U. S. Bureau of Mines, Dallas, registration chairman; E. H. Blum, Atlantic Refining Co., Dallas, general committee chairman; E. A. Stephenson, University of Kansas, chairman, petroleum division, A.I.M.E.; W. S. (Buck) Morris, East Texas Engineering Committee, chairman program committee, and W. E. Winn, Sun Oil Co., Dallas, arrangements committee chairman

Reservoir Performance Discussed by A.I M.E.

By D. H. STORMONT

DALLAS, Tex.—Highlighted by a forum on reservoir performance, a large number of technical papers dealing with oil formation studies and characteristics of reservoirs were presented at the fall meeting of the Petroleum Division of the American Institute of Mining & Metallurgical Engineers, held here October 16-18. In all, 18 technical papers were delivered at the five sessions held during the 3-day meeting. Total registration was about 350, with the sessions drawing attendances of some 250 to 300 listeners.

The forum on reservoir performance was held in the concluding session on Saturday morning, sponsored by the production engineering committee of the A.I.M.E. This session consisted of two papers dealing with subsurface water encroachment, and a summary of replies to a questionnaire sent out by the committee on the subject of fundamental principles of reservoir performance. As many of the points covered in the forum were of a controversial nature, much discussion was provoked from the engineers in attendance.

The two papers read were "Production Under Effective Water Drive as a Standard for Conservation Practice," by E. De Golyer, and "A Study of Edgewater Encroachment in Petroleum Reservoir Sands," by Frank G. Miller, of the Bureau of Mines. A digest of Mr. De Golyer's paper is given in this issue on Page 53.

Mr. Miller's address reported some 30 laboratory experiments in which oil was recovered by water drive from specially prepared oil-filled columns of unconsolidated sand having a particle-size range within usual oil-field limits. From his studies the author concluded that because oil-recovery efficiency in fields having effective natural water drive generally is believed to bear an inverse relationship to the rate of water encroachment, under certain idealized laboratory conditions and within a definite range of low water-encroachment rates, the percentage of oil recovered increases with the rate of water encroachment. Also, that the influence of the rate of water encroachment on oil recovery is more pronounced at lower than at higher rates.

Most of the papers presented at the A.I.M.E. meeting in Dallas are abstracted in this issue, on pages 50-54.

President Suman Opens Meeting

Opening address of the meeting was delivered by John R. Suman, A.I.M.E. president, his talk dealing with world supplies of strategic war materials. Present and indicated 1942 output of each of these necessary war materials by the democracies and by the Axis were analyzed, and a forecast made as to 1942 oil production. Mr. Suman pointed out that Germany is ahead of the Allies only in the production of magnesium and aluminum, and that within the next year United States and allied output of these two metals will exceed that of the Axis.

In the Thursday afternoon session W. L. Horner, James A. Lewis, and Marion Stekoll, of Core Laboratories, Inc., Dallas, discussed the practical application of productivity indexes. The authors presented significant data which show a relationship between measured productivity index and certain commonly measured reservoir characteristics. Among the more important measurements found to correlate with productivity index were permeability, formation thickness, oil viscosity at reservoir conditions, and formation volume factor. The authors also gave productivity index determinations for a number of wells, together with some significant results from core analyses and bottom-hole sample analyses.

Papers Abstracted

Four Thursday papers presented by J. N. Flaitz and A. S. Parks, A. D. Brokaw, Don B. Carson, and D. L. Katz, and J. E. Owen are given in abstract form on pages of this issue. Other papers given on Thursday were: "Secondary Recovery Program at Oklahoma City," by D. L. Katz, and "Potential Well-Testing Technique by Back-Pressure Methods in Kansas," by Charles Rodd of Gulf Oil Corp.

"Significance of Permeability Coefficients" was the subject discussed by E. S. Burnett of the Bureau of Mines in a Friday morning address. A method of studying and evaluating factors entering into permeability calculations was presented and capillary structures of various type structures discussed. One point brought out was that due to the wide variance in sand porosities, 40 per cent of the porosity accounts for 89 per cent of the

(Continued on Page 102)

Below: George Fancher, University of Texas; W. B. Heroy, vice president, Pilgrim Exploration Co., Houston; A. B. Parsons, A.I.M.E., New York, and Francis Heath, Sun Oil Co., Dallas

Above: I. V. Teague, Hogg Oil Co., Houston, and L. E. Tracy, Oil Well Supply Co., Dallas, chairman, entertainment committee

STATE CAPITALS...

ILLINOIS

THE TOTAL NUMBER of suits to test constitutionality of the state's new oil production-tax law has been increased to 20.

On October 16, Judge L. E. Stone of Sangamon County Circuit Court ordered the state to hold $117,281.11 in taxes in the finance department "protest fund," supplementing previous injunctions tieing up more than $130,000 additional taxes paid by operators since July.

Later, injunctions were granted October 19 to five other petitioners for taxes amounting to $134,468, bringing the total now withheld as a basis for a court test to more than $380,000.

Plaintiffs include some of the largest operators in the state, all of whom have instructed their attorneys to seek an early decision on the entering suits.

New plaintiffs and the amount of tax refunds sought include Carter Oil Co., $51,184; Pure Oil Co., $48,150.22; Ashland Oil & Refining Co., $13,665.31; and Frank H. Schroeder, Lewis Production Co., J. B. Whisenant, and John Trenchard, operating as partners; Con P. Curran, R. G. Whipple, S. J. Ewald, $857.93; Frontier Fuel Oil Co., $3,423.65; Texas Co. $85,904.16; Superior Oil Co., $17,989.15; Ohio Oil Co., $29,803.23; Central Pipe Line Co., $563.43, and nine royalty owners.

Temporary injunctions were secured September 18 and 19 by Sohio Corp., Shell Oil Co., Inc., Texas Co., Adams Oil & Gas Co., and several royalty owners.

The new law, which became effective July 1, levies a tax of 3 cents per barrel on all oil produced in the state. The measure was slated to yield approximately $3,500,000 annually in revenue to the state, but George B. McKibbin, finance director, has admitted that steadily increasing production will bring a greatly increased amount into the state treasury.

Collections from all sources will continue in spite of the temporary injunctions, state officials said.

TEXAS

NO LIMIT ON PRODUCTION except to prevent physical waste was urged this week by Ernest O. Thompson, chairman of the Railroad Commission, at a state-wide proration hearing at Austin. Mr. Thompson expressed the hope the industry would ask federal officials for permission to open their wells to get as much crude oil aboveground as possible. Declaring that it is "derelict for oil producers not to produce as much crude oil without physical waste as they can," he stated that Texas might make up the 100,000 bbl. which he said Oklahoma had been authorized to produce but had not produced.

At the start of the hearing, intended to receive evidence on which to base future allowable crude production, the commission disclosed purchasing nominations for oil in November totaled 1,892,039 bbl. a day, an increase of 53,557 over the October nominations. The commission also announced the U. S. Bureau of Mines estimate of market demand for Texas oil in November was up 34,600 bbl. over October to 1,454,700 bbl.

A number of producers asked increased allowables, particularly those able to supply low-cold-test crude used by the Navy. Rex Baker of Houston, representing the Humble Oil & Refining Co., said there was a strong demand for this type of oil and asked for an increase of 23,000 bbl. a day in the production of about 30 fields yielding it.

LOUISIANA

CURRENT WELL-SPACING regulations in the Logansport gas field in De Soto Parish will likely be continued on a 320-acre basis, state Conservation Commissioner W. H. Hodges said last week, but no final action will be taken until the engineers and geologists have completed checking and analyzing evidence presented at a hearing in New Orleans. Mr. Hodges said the current spacing order apparently allowed gas to be produced economically, and added that pipe and drilling supplies were hard to get for less spacing unless priority orders could be obtained.

PETROLEUM PRODUCTS used by contractors in construction of army camps on "cost plus fixed fee" contracts with the federal Government are subject to state taxes under a ruling handed down last week at New Orleans by the state Supreme Court. The decision reversed a ruling of the lower court of District Judge Charles A. Holcombe, who held, in a Standard Oil Co. of Louisiana case, that the tax was illegal.

ISSUES ILLINOIS PERMITS . . .

ROBERT JEAN recently was made supervisor of drill permits, Division of Oil and Gas Conservation, Illinois Department of Mines and Minerals. Illinois oil operators are now required to secure drilling permits before starting drilling operations under provisions of the new control bill which became effective July 28. Mr. Jean was assigned to his new post because of his previous experience in petroleum operations as a member of the Mines and Minerals Department staff. He is a graduate of the college of engineering, University of Illinois

OKLAHOMA

DAILY PRODUCTION ALLOWABLE for Oklahoma pools for November will be set by the Corporation Commission following the monthly market-demand hearing which has been set for 11 a.m. Friday, October 31, at Oklahoma City. Producers and purchasers will submit their recommendations at a meeting with J. J. O'Laughlin, state conservation officer, previous to the commission's session to review the demand situation. Indications last week were that the daily allowable would be kept at the 428,000-bbl. total which has controlled production for September and October.

HOBART FIELD operators will also be heard by the commission on October 31 in their disagreement on allowable for that field. The dispute arose during the last monthly market demand hearing and was continued after a day of argument and testimony. Shell Oil Co., Inc., one of four Hobart operators, wanted the wells cut back to 60 or 70 per cent of potential with potential tests to be taken at once.

Another operator wants production continued on the present basis which, it is generally agreed, is virtually wide open. Since September 1, the only restriction has been a 4,200-bbl.-a-day total allowable for the field. The two other operators have taken no stand.

SOUTH BURBANK allowable for October as approved by T. B. Hall, superintendent, and E. C. Arnold, oil and gas supervisor for the Osage Indian Agency, is computed at 228,285.74 bbl., or at the daily rate of 7,392.17 bbl. Complete records showed the August runs were 228,967.68 bbl., based on a monthly allowable of 228,258.48 bbl. from 210 wells.

CALIFORNIA

THE CALIFORNIA OIL INDUSTRY still is without detailed information on negotiations between Ernie Pyles' District 5 production committee and the petroleum coordinator's office in Washington and wonders why all meetings have been held behind closed doors and everyone pledged to secrecy. California operators have voiced their disapproval of the secrecy surrounding negotiations.

KANSAS

MARKET-DEMAND HEARING for the determination of state crude-production allowable for November and for allocation of market demand to various pools was set by the state Corporation Commission for 2 p.m. Friday, October 24, at Wichita. Current Kansas allowable is 256,500 bbl., set with a view to holding within the state's pipeline capacity to avoid pipe-line proration and creation of underages. Purchasers of crude nominated a total of 273,929 bbl. daily for October, and the commission found the state could produce, without waste, in excess of 400,000 bbl. a day.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

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Compact Must Continue

Indicative of the fact that in times like these it is easy to be confused as to issues which transcend emergencies and which go to the roots of our economic order, there are those who are asking whether the Interstate Oil Compact Commission has any place at this time and in the future in directing petroleum operations.

It has been assumed by some that the Office of Petroleum Coordinator has superseded or taken over the work of the compact. It is also pointed out that the compact was "ignored" in the establishment of the OPC organization.

These and similar observations add up to very little. The compact, now in its seventh year and recently extended to 1943, was created by an act of Congress. It has been approved by 11 oil states as provided by the Constitution of the United States. Back of this approval are the state conservation laws, the principal tenets of which have been sustained by the higher courts.

Thus the compact is the legal body created to implement conservation principles as they pertain to interstate oil operations. In any question of authority or the right to ignore other bodies, the advantage obviously rests with this legally created unit rather than with a coordinating agency established by presidential decree.

There has been criticism of past activities—or their lack—of the compact. Some of this criticism probably has been justified; partly it comes from an erroneous conception of the duties of the interstate organization. The compact has no specific powers of control and its effectiveness arises entirely from the cooperative action of the member states. It has nothing to do with price and is only concerned with interstate matters which have a direct relationship to petroleum conservation.

Interstate compacts have increased rapidly in recent years and 44 states now have one or more agreements applying to a wide range of agricultural and industrial activities. They have in all instances given workable answers to questions arising when production or marketing overlaps state lines and becomes sectional or national in scope.

President Roosevelt who highly commended the accomplishments of the oil compact at the time he signed the bill providing for its extension, when governor of New York, used compacts in solving many mutual problems of that state and its neighbors.

A representative of a new member state at the Fort Worth meeting last week accurately described the compact as the democratic way of preserving state rights and free enterprise. Another older member made direct application to the petroleum industry when he said: "What the states do under the oil compact during the emergency will determine whether another agency takes over when the emergency is ended."

Oil operators in small groups and in general meetings in recent weeks have again pledged their full support to the defense program in whatever form their services are required. They are aware that this means the passing of coordinating powers to Washington without which an all-out effort for this country, including aid to others, will fall short of its objectives.

At the same time the industry realizes it can best serve the peacetime economy of this country by returning to preemergency practices as quickly as possible. Assurance that this will materialize rests in the maintenance of present state controls and the continuance of interstate cooperation through the compact.

The compact commission itself has increased responsibilities in times like these. Nothing should be left undone in seeing that its complete program, now well outlined, is made effective in every particular.

Watching WASHINGTON

By HENRY D. RALPH

OPM Revises Priority Rules for Repair and Maintenance

WASHINGTON, D. C., Oct. 20.—A revised system of priority assistance for maintenance and repair of practically all industry, including petroleum, has been put into effect by the Office of Production Management.

Preference Rating Order No. P-22 has been amended and reissued under the same number but in considerably different language.

As applied to the oil industry the revision of P-22 is in general a liberalization and will make it easier for operating concerns in the industry to obtain essential materials. On the other hand, the order is hedged about with a number of restrictions to prevent excess purchasing and accumulation of stocks.

While the old P-22 applied only to repair materials, the new order also covers maintenance, and in addition it may be used to obtain operating supplies such as fuel, lubricants, catalysts, and small perishable tools. The order is specific in prohibiting its use to obtain materials to be incorporated in a product to be sold by a producer, or used to expand or improve his capital plant, or of a type not heretofore used for maintenance.

The oil industry is one of a few named individually in the revised P-22, which includes in the definition of producer the language "Petroleum—discovery, development, and depletion of petroleum pools." This is a broader definition than in the original P-22, and is interpreted to include such operations as exploration, geophysical prospecting, and well perforating. OPM attorneys had interpreted the old order as excluding such activities from the definition of "production."

Other branches of the oil industry are included in the definitions of manufacturing, processing, or fabricating; warehousing; wholesaling; and carriers. These definitions are interpreted to cover bulk stations, terminals, tankers, barges, and refineries. Pipe-line transportation is not specifically covered, as in the original P-22, but the OPM announcement said the revision is intended to apply to all activities covered by the original. Service stations and retail marketing activities are excluded, along with all other types of retailing.

All orders for materials coming within the scope of P-22 are automatically given an A-10 preference rating without application to, or clearance through, Washington by an endorsement on an ordinary purchase order. However, the revised P-22 requires the purchaser to certify that he is familiar with the provisions of P-22, and to keep duplicate orders, separate from all others, for 2 years. These files will be subject to audit, and later producers will be asked to make periodic reports of material obtained under P-22 authority.

Oil well-equipment houses may use P-22 to obtain maintenance and repair materials to keep their own facilities in operating condition, since they come under the definitions of warehousing and wholesaling, but they may not use P-22 to obtain inventories of supplies for sale in advance of P-22 orders from purchasers. This was a matter never fully clarified under the old P-22. The new language states that the preference rating shall not be applied "by a supplier to obtain materials for a delivery by him which has not been rated pursuant to this order." This means that a supplier can apply the automatic A-10 preference rating only to get material to fill an order on hand from a producer, and not in anticipation of such orders.

Oil equipment-supply houses, however, are discovering that they can operate under the terms of Metal Allocation Order M-21-b and its supplements, which gives an A-9 rating to steel warehouses. A warehouse is defined as any person who receives physical delivery of steel from a producer (of steel) for sale or resale in the form received. There are certain restrictions in these M-21 orders, but in general oil well-supply houses can obtain inventories of steel products in anticipation of orders from consumers, even though they may not obtain steel or other supplies under P-22.

The revised P-22 contains a number of restrictions which, in view of the heavy penalties for misuse, should be studied carefully by all persons who attempt to operate under it. For example, P-22 may not be used unless supplies cannot be obtained otherwise, nor to obtain supplies in larger quantities or earlier than actually required, nor when any other material may be substituted. There are also restrictions on the quantity of material any concern may obtain in any one quarter, based on actual use during 1940.

Oil is now subject to priority control to a limited extent because P-22 applies to fuel and lubricants. This means that concern covered by P-22 can put an A-10 preference rating on its order for purchase of fuel or lubricants, and such orders automatically become defense orders and must be filled ahead of all other orders bearing lower preference ratings or none at all. Purchasers of oil, however, may not apply the A-10 rating unless they cannot obtain deliveries otherwise.

Ickes Reports Continued Shortage

IMPROVEMENT in supplies of light fuel oil on the East Coast was reported last week by Petroleum Coordinator Ickes, but there is still a deficit in over-all supplies of petroleum products. Gasoline inventories in the East Coast area last week, he said, were 1,132,000 bbl. under the corresponding week a year ago, and heavy fuel-oil inventories were 2,577,000 bbl. below 1941's level.

Total inventories on the Atlantic seaboard of petroleum and principal products now stand at 3,112,000 bbl. less than was on hand a year ago, according to inventory figures for the week ended October 11.

The coordinator pointed out that stocks on hand last year are generally regarded as being insufficient to meet present and future needs. Increased heavy civilian demand, defense-industry needs, military oil needs of the Army and Navy, foreign requirements, and other mounting demands will require in the aggregate that inventory levels be pushed beyond those of last year, Mr. Ickes said. The actual deficiency on the East Coast, therefore, he added, exceeds considerably the mere difference between current inventory levels and those of 1940.

Restrictions on deliveries of gasoline, Mr. Ickes said, have enabled oil companies to rearrange tanker schedules so as to ship less gasoline and more heating oils. This, combined with the warm weather this autumn, has made possible the building up of the heating-oil supply, which was one of the principal objectives of the coordinator's program.

Meanwhile, Mr. Ickes reported that tank-car movement of petroleum and its products into the East Coast area—involving combined use of pipe lines, barges, and railroads—moved upward again for the week ended October 11. The increased movement was carried out in accordance with the announced policy of the OPC that every means of transportation be pressed into service in an effort to alleviate the shortage impending in the East Coast area.

During the week, 4,322 tank cars of oil were shipped into District 1 from outside the area. This represents an average of 617 cars per day. These figures compare with a total of 4,099 cars during the previous week, or an average of 585 cars per day.

The figures, obtained from reports from the 12 principal oil companies operating on the East Coast, represent a continued upward trend in the combined use of facilities. While some of the movement came direct by long rail haul from the Mid-Continent producing fields, much of it was transported by pipe line or barge to terminal points from which it was transshipped by rail into the East Coast area.

PRIORITIES:

Amendment to Order P-22 Eases Problem Of Obtaining Steel For Repair Service

Preference Rating Order P-22 (amended).

Section 958.1, Preference Rating Order P-22, is hereby amended to read as follows:

958.1 For the purpose of facilitating the acquisition of material for (1) the maintenance and repair of the property and equipment of producers as hereinafter defined, and (2) the continued operation of the property and equipment of such producers, a preference rating is hereby assigned to deliveries of such material upon the terms hereinafter set forth. Such terms shall control until such time as the Office of Production Management certifies specific quantities of such material to which the preference rating herein assigned may be applied, or until the Office of Production Management may specifically limit production by any type of procedure or withdraw any type of material from use by such producer, or until the Office of Production Management may issue an order specifically relating to the maintenance, repair, and operation of the property and equipment of any type of producer.

(a) Statement of policy.

It is the purpose of this Order to effectuate the policy of the Supply Priorities and Allocations Board in maintaining governmental, charitable, and industrial property located in the United States, its territories and possessions, upon adequate operating basis, without expansion or improvement of facilities except where duly authorized or approved. The terms and conditions of this Order are to be interpreted in conformity with this expressed policy.

(b) Definitions.

1. "Producer" means:

(*i*) Any governmental unit.

(*ii*) Any individual, partnership, association, corporation, or other form of enterprise engaged in one or more of the following activities or acting in one or more of the following capacities to the extent that it is so engaged or so acts:

(*a*) Manufacturing, processing, or fabricating.

(*b*) Warehousing—maintaining warehouses for storage or distribution of any material.

(*c*) Wholesaling—acting as a distributor of products sold to manufacturers, wholesalers, retailers, or other persons not consumers.

(*d*) Charitable institutions—any charitable or eleemosynary institution which is recognized as such for purposes of the Internal Revenue Laws of the United States.

(*e*) Carriers—urban, suburban and interurban common or contract carriers of passengers or freight by electric railway, electric coach, motor truck, or bus, including terminals of any of the foregoing: railroads, including terminals; shipping—commercial carriers of freight and passengers by ocean, lake, river, or canal, including terminals.

(*f*) Educational institutions (including vocational training).

(*g*) Printers and publishers.

(*h*) Radio—commercial broadcasting and communication.

(*i*) Telephone and telegraph communication, including wire services.

(*j*) Hospitals, clinics and sanatoriums.

The special service on priorities this week, continuing a series that has been appearing in each issue of The Oil and Gas Journal starting September 11, consists of the full text of the amendment to Preference Rating Order P-22, published herewith.

Objective is to aid operators in all branches of the petroleum and natural-gas industries and manufacturers and suppliers of materials and equipment. Questions and answers on priority problems are excluded from this week's issue because of the importance of the amendment and because its issuance casts a different aspect on many of the problems.

The Oil and Gas Journal's machinery for answering questions on the procurement of materials is still available to all operators and suppliers of materials. Questions should be fully stated and addressed to The Oil and Gas Journal, Priorities Question Department, P.O. Box 1260, Tulsa.

(*k*) Petroleum—discovery, development and depletion of petroleum pools.

2. Material means any commodity, equipment, accessories, parts, assemblies or products of any kind.

3. Subject to subparagraph (6), "maintenance" means the upkeep of a producer's property and equipment in sound working condition.

4. Subject to subparagraph (6), "repair" means the restoration of a producer's property and equipment to a sound working condition when such property or equipment has been rendered unsafe or unfit for service by wear and tear, damage, destruction of parts, or similar causes.

5. Subject to subparagraph (6), "operating supplies" means any material which is essential to the operation of the producer's business and which is consumed in the course of such business, including without limitation, fuel, lubricants, catalysts, and small perishable tools. Provided: it shall not include any material which is physically incorporated, in whole or in part, into any product of the producer, or into any material which the producer distributes to or stores, transports or services for another person.

6. The terms "maintenance," "repair," and "operating supplies," do not include material.

(*i*) For the improvement of a producer's property or equipment through the replacement of material in the existing installation with material of a better kind, quality or design.

(*ii*) For additions to, or expansion of, such property or equipment.

(*iii*) Which is of a type not heretofore carried on the producer's books under "maintenance," "repairs," "operating supplies" or the equivalent.

7. "Supplier" means any person with whom a purchase order or contract has been placed by a producer or another supplier for material.

(*i*) Required by the producer as operating supplies or for the maintenance or repair of his property or equipment, or

(*ii*) To be physically incorporated in other material so required by the producer.

(c) Assignment of preference rating.

Subject to the terms of this Order Preference Rating A-10 is hereby assigned:

1. To deliveries, to a producer, of material required by him as operating supplies or for the maintenance or repair of his property or equipment.

2. To deliveries, to any supplier, of material.

(*i*) Required by a producer as operating supplies or for the maintenance or repair of his property or equipment, or

(*ii*) to be physically incorporated in other material so required by a producer.

(d) Persons entitled to apply preference rating.

The preference rating hereby assigned may be applied by:

1. A producer.

2. Any supplier provided deliveries to a producer or another supplier are to be made by him, which are of the kind specified in paragraph (*c*) and have been rated pursuant to this order.

(e) Application of preference rating.

1. A producer or supplier, in order to apply the preference rating to deliveries of material to him, must endorse the following statement on the original and all copies of the purchase order or contract for such material manually signed by a responsible official duly designated for such purpose by such producer or supplier:

> "Material for maintenance, repair, or operating supplies—Rating A-10 under Preference Rating Order P-22, as amended, with the terms of which I am familiar."

Such endorsement shall constitute a certification to the Office of Production Management that such material is required for the purposes stated and that the application of the rating is authorized by this Order. Any such purchase order or contract for such material shall be restricted to material the delivery of which is rated in accordance herewith.

2. The producer or supplier placing any such rated purchase order or contract and the supplier selling the material covered thereby must each retain endorsed copies of such purchase orders or contracts, segregated from all other purchase orders or contracts, for a period of 2 years from the dates thereof for inspection by authorized representatives of the Office of Production Management.

(f) Restrictions on application of rating.

The preference rating hereby assigned shall not be applied:

1. Unless the material to be delivered cannot be secured when required without such rating;

2. By a producer, to obtain deliveries greater in quantity, or on dates earlier, than required for the operation, maintenance or repair of such producer's property or equipment;

3. By a supplier, to obtain material for a delivery by him which has not been rated pursuant to this Order;

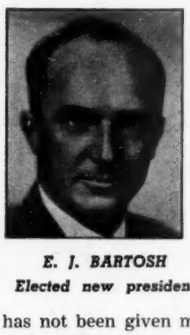
4. By any producer or supplier to obtain scarce material the use of which could be eliminated

(Continued on Page 101)

Pacific Coast Geologists Hold Eighteenth Meet

By L. P. STOCKMAN

THE Pacific section of the American Association of Petroleum Geologists concluded its eighteenth annual meeting with a dinner dance at the Fiesta Room in the Ambassador Hotel in Los Angeles, October 17, after a 2-day meeting which was very successful and exceptionally well attended. The first day's session was primarily of an academic nature, being devoted to the Cretaceous age which is becoming of more importance from a production standpoint. Heretofore the Cretaceous has not been given much consideration by geologists except in the search for natural gas. Most California gas fields produce from the Cretaceous but very little crude-oil production comes from rocks of Cretaceous age. The discovery of Jergins Oil Co. in the Panoche district of Fresno County brought the Cretaceous into the limelight earlier this year and since that time considerable research has been going on to determine the production possibilities of this section. The Panoche well produced at the rate of about 150 bbl. of high-grade oil per day until shut in pending a survey of production possibilities of formations in this age. It is a very important development because if the Cretaceous is found highly productive it will cause a general reclassification of potential productive areas and lead to aggressive drilling in the central part of the state as well as requiring deeper drilling in present productive areas that produce from rocks of more recent age.



E. J. BARTOSH
Elected new president

Del Valle Geology

The morning session on Friday, October 17, included papers on the "Geology of the Del Valle Area" by L. A. Tarbet, of Standard Oil Co., and "Geological Notes on the Oak Canyon Oil Field" by Wayne Loel, R. W. Clark and Paul Goudkoff. The latter covered the paleontology of Oak Canyon and surrounding area. The two final papers of the morning session consisted of "Oil Fields, Before and After Development" by James C. Kimble, of General Petroleum Corp., and the "Relationship Between Some Types of Gravity Anomalies and Structure" by Robert H. Miller, of Western Gulf Oil Co. The afternoon papers on the final day included papers by Robin Willis, of Hilldon Oil Co., on "Some Drilling Time Logs and Their Use" and "The Northwest Extension of the Inglewood Field." Lowell C. Beers, of Lane-Wells Co., presented a paper on "Radioactivity Well Logging Through Casing."

E. J. Bartosh, of Bankline Oil Co., who has been secretary-treasurer of the Pacific section of the A.A.P.G. for the past 2 years, was unanimously elected president of the section for the coming year. Mr. Bartosh succeeded E. W. Galliher, of Barnsdall Oil Co., who was elected president following the resignation of Frank Hudson, formerly of Shell Oil Co., Inc., who was elected president at the last annual meeting. When Mr. Hudson resigned from Shell Oil Co., Inc., he felt obligated also to resign as president of the Pacific section. The Pacific section of the Society of Paleontologists and Mineralogists, affiliated with A.A.P.G., held a meeting at the Clark Hotel in Los Angeles, October 16, and elected M. N. Bramlette, of University of California at Los Angeles, president for the coming year. G. T. Bowen, of Standard Oil Co., was elected secretary-treasurer at the annual meeting presided over by Frank Tolman. The sessions of the Pacific section of the A.A.P.G. were presided over by E. W. Galliher, Mason L. Hill, Albert Gregersen and E. R. Atwill.

At the luncheon on Thursday, Basil B. Zavoico, of Chase National Bank, discussed the topic "Petroleum Orients War," which the author requested be not reported. Edgar W. Owen, president of the A.A.P.G., indicated that the present established potential production of many fields in the United States is far too high and in some cases is based on potentials established a number of years ago. He also questioned the ability of many fields to produce anywhere near their established potentials for sustained periods. He also brought out the fact that there are relatively few undrilled locations and this same condition prevails in California. Discoveries in recent years have been small and therefore he indicated that geologists would find it necessary to again enter the exploration field in place of their specialized work. Mr. Owen also indicated that there is very little new money flowing into the oil industry and that high taxes are discouraging exploration.

A. G. A. Honors Weymouth With Munroe Medal

ATLANTIC CITY, N. J.—Problems arising out of a rapid expansion of demands upon the natural-gas industry due to the national-defense program dominated discussions and papers at sessions of the Natural Gas Section of the annual meeting of the American Gas Association at Atlantic City, N. J., this week. The convention opened Monday, October 20, with the natural-gas sessions, and continued through Wednesday, October 22.

Highest honor within the gift of the American Gas Association was conferred Tuesday on Thomas R. Weymouth, who retired on April 1 as vice president of the Columbia Gas & Electric Corp. Mr. Weymouth received the Charles A. Munroe Award for having made the most outstanding recent contribution toward the advancement of the gas industry.

J. French Robinson (left), newly elected chairman of the Natural Gas Section of the American Gas Association, and Thomas R. Weymouth, who was given the Charles A. Munroe Award for outstanding service to the natural-gas industry

After the opening business and election of officers was completed, Howell C. Cooper, chairman of the main technical and research committee, made his report. Then C. George Segeler, engineer of utilization of the association, New York, gave a paper on "Alternative and Auxiliary Gases From Liquefied Petroleum Products" (see extended digest on Page 41 of this issue), and Davis M. DeBard, vice president of Stone & Webster Service Corp., New York, described civilian protection and gas-utility operations in wartime England.

The meeting was then given over to a panel discussion of regional problems presented to gas utilities in the defense program. While all sections reported heavy increases in demand for gas, A. F. Bridge, vice president of the Southern Counties Gas Co., Los Angeles, Calif., said that the abrupt expansion of business and industry in the Pacific Coast states had a more profound effect and created more problems than in any other area.

J. French Robinson, president of the East Ohio Gas Co., Cleveland, Ohio, was elected chairman of the Natural Gas Section, and B. H. Gardner of the Columbia Engineering Corp., Columbus, Ohio, was elected vice chairman.

Other 1941-42 officers elected at general and section sessions were:

President, George S. Hawley, president of the Bridgeport Gas Light Co., Bridgeport, Conn.; vice president, A. F. Bridge, vice president and general manager of Southern Counties Gas Co., Los Angeles, Calif.; treasurer, Ernest R. Acker, president of Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y. Directors (2-year terms), Walter C. Beckjord, vice president and general manager, Columbia Gas & Electric Corp., New York, N. Y.; C. M. Cohn, executive vice president, Consolidated Gas Electric Light & Power Co., Baltimore, Md.; Watson E. Derwent, vice president, George D. Roper Corp., Rockford, Ill.; Ralph L. Fletcher, vice president, Providence Gas Co., Providence, R. I.; R. H. Hargrove, vice president and general manager, United Gas Pipe Line Co., Shreveport, La.; D. A. Hulcy, president, Lone Star Gas Corp., Dallas, Tex.; Bruno Rahn, president, Milwaukee Gas Light Co., Milwaukee, Wis.; Louis Ruthenburg, president, Servel, Inc., Evansville, Ind.; E. J. Tucker, general manager and secretary, Consumers Gas Co. of Toronto, Toronto, Ont., and H. Carl Wolf, president, Atlanta Gas Light Co., Atlanta, Ga.

International

Great Britain . .

Private Cars Still in Operation Total 1,000,000

DESPITE drastic restrictions on gasoline consumption in Great Britain, it is estimated that approximately 1,000,000 private automobiles are still operating in that country. In addition there are about 580,000 commercial vehicles, buses and taxicabs.

Available data indicate that since the beginning of the war nearly 750,000 motor vehicles of all types have been withdrawn from civilian use and the majority of them have been absorbed by the military forces. This information was compiled by the U. S. Department of Commerce.

One of the outstanding features of the present year in the British automotive trade is the rise in prices of second-hand cars, low horsepower British makes being particularly in demand. While further curtailment of gasoline supplies has had the effect of reducing automobile prices, small cars in good condition are still eagerly sought and it is expected this demand will continue for the remainder of the year.

Latin America

Colombia Resumes Crude Exports to United States

COLOMBIA resumed the export of crude oil to the United States in July after 2 months' lapse and in the same month Ecuador, looking for markets to replace those lost as a result of the war, shipped crude oil to this country for the the first time this year. In spite of these two additions, total exports of crude oil and refined products from Latin-American countries to the United States were off from the previous month. In July they totaled 6,077,544 bbl. against 6,428,401 bbl. in June.

Venezuela was largely responsible for the decline, her exports to the United States under the Venezuela trade agreement totaling 3,654,285 bbl. in July against 4,403,684 bbl. in June. June shipments to the United States consisted of 235,839 bbl. of residual fuel oil, 3,247,434 bbl. of crude oil and 171,012 bbl. of gas oil and distillates. For the first 7 months of the year Venezuelan exports to the United States were 27,504,771 bbl., or 60.4 per cent of her quota under the agreement.

Netherlands West Indies' shipments to this country in July were 742,358 bbl. against 1,322,920 bbl. in June. The July shipments consisted of 570,636 bbl. of residual fuel oil and 171,722 bbl. of gas oil and distillates. For the first 7 months Netherlands West Indies exports to this country were 8,237,306 bbl., 59.7 per cent of her quota.

Colombia shipped 335,948 bbl. of crude to the United States in July, more than her total for the entire first 4 months of the year. For the first 7 months, Colombia exported 653,019 bbl. of crude oil to this country, 31.5 per cent of her quota. Ecuador shipped 107,136 bbl. of crude oil to the United States in July, her first shipment to this country in many months. Mexico stepped up her exports to the United States substantially in July when they aggregated 1,237,817 bbl. against 701,887 bbl. in June. For the first 7 months of this year, Mexico's exports to the United States totaled 6,884,665 bbl. In July they consisted of 73,290 bbl. of residual fuel oil, 966,658 bbl. of crude oil and 197,869 bbl. of gas oil and distillates.

A tabulation of exports by countries affected by the Venezuela trade agreement to the United States in July and for the first 7 months of this year follows:

Country—	July	1st 6 months
Venezuela	3,654,285	*27,504,771
Netherlands West Indies	742,358	*8,237,306
Colombia	335,948	653,019
Mexico	1,237,817	6,884,665
Trinidad and Tobago	.....	61,255
Other countries	†107,136	110,048
Total	6,077,544	43,451,064

*Revised. †All Ecuador crude.

Mexico . .

Collapse of Oil Plan May Block Government Loan

PROSPECTS for early settlement of the Mexican oil-expropriation question appear to have been virtually ended by the rejection of the recent proposal advanced by Mexico involving a token payment of $9,000,000 for the properties. The payment was to be made as part of a general agreement between the United States and Mexican governments under which this country would advance $60,000,000 in loans to Mexico. No further conferences have been held involving the oil companies, indicating that the expropriation question stands unchanged.

As viewed by outsiders, the oil companies believe that the only solution of the problem, so far as they are concerned, would be the return of the properties, inasmuch as Mexico's ability to pay equitable compensation in accordance with the principles of international law is questioned. Indications point to efforts on the part of the Mexican Government to bring about a settlement under which the oil companies would be forced to relinquish their basic rights which they maintain are in accordance with the Mexican constitution as well as international law.

While the present regime in Mexico is apparently anxious to reach a settlement, present world conditions would also serve as a spur to an agreement which would make possible a resumption of large-scale operations in the Mexican oil fields. The production of crude oil and the refinery output of Mexico have declined steadily since the expropriation. Along with this, the oil workers of Mexico have fared worse under the government regime. However, a strong political group in Mexico seems to have decided that under present unusual world conditions, and in view of the attitude of the United States administration toward "hemisphere solidarity," a settlement short of the return of the properties might be effected.

At the same time, certain political elements in Mexico appear to have shown growing dissatisfaction with the trend of the oil situation. Some members of the Mexican Congress are reported to have expressed themselves as opposed to the current policy pursued in the sale of oil for export, claiming that the prices being paid to Mexico are far too low. This criticism is in spite of the fact that prices reported being received are above those paid on contracts existing in 1940.

Last year Mexico is said to have sold a considerable quantity of heavy fuel oil for export at prices far below world markets. Quotations as low as approximately 30 cents a barrel were reported paid f.o.b. Tampico, against a world price of around 70 cents a barrel. At present, although Mexico is obtaining better prices, the shortage of tankers has limited deliveries.

The return of the expropriated oil properties to the American and British oil companies at this time, it is pointed out, would probably result in renewed activity in the development of Mexico's oil industry and would be considered a definite indication of the nation's friendship with the United States. It would serve to promote friendly relations with both the United States and Great Britain.

Although reports have been current of further negotiations looking toward a settlement of the question, it is believed that nothing along that line can be expected unless there is a considerable change in attitude in Mexico on the subject.

Brazil . .

Economies Instituted to Save 30 Per Cent on Oil

IMPORTATION of gasoline and other petroleum products at the normal rate has been prevented by tanker-ship shortage. As a result, the National Petroleum Council appointed a commission and state committees to develop ways of reducing by 30 per cent the consumption of petroleum products in Brazil.

In the State of Rio de Janeiro, steps taken by the interventor (state executive) include examination of bus companies' operating conditions with a view to reducing the number of trips; ordering state trucks to operate only with full loads; and permitting the use of animal transport, even in cities.

Additional economies in use of liquid and solid fuels: gas companies' clients have been asked to use less gas, to preserve present stocks of imported coal; many industries are adapting their fuel-burning equipment to the use of substitutes for imported fuels, such as Brazilian coal, charcoal, wood, and cottonseed cake; the Central do Brasil Railway has contracted for 15,000 tons of cottonseed cake to burn in place of coal; more motor-vehicle owners have installed gasogene (producer-gas) equipment, and alcohol is being mixed with gasoline for motor fuel.

Argentina . .

Ultramar Abandoning Piedra Clavada Wildcat

THE Ultramar S. A. P. A. 1 Piedra Clavada wildcat test has been abandoned after completion of tests. The well was drilled to 4,756 ft.

SPAB Favors Highest Priority On 100-Octane Equipment

By HENRY D. RALPH

WASHINGTON, D. C., Oct. 20. — Issuance of highest obtainable priority ratings on all types of equipment required to make 100-octane gasoline is favored by the Supply Priorities and Allocations Board, Wright W. Gary, director of refining, Office of the Petroleum Coordinator, told representatives of the oil industry here today.

Meeting with officials of the refining division to discuss ways and means of quickly tripling the nation's refining capacity for 100-octane gasoline to meet a growing demand for this fuel on the part of American armed forces and the various countries "resisting aggression," the oil-company representatives were warned by Mr. Gary of the urgent need for speed in consummating the program proposed by Coordinator Harold L. Ickes. Storage stocks of 100-octane gasoline, Mr. Gary said, will be falling behind production at the rate of 39,000 bbl. daily by January 1, 1942.

Mr. Gary told the industry representatives that in addition to the position taken by SPAB, the Army and Navy Munitions Board has expressed itself, in writing, as approving preference ratings of A-1-a for immediate construction of new plants which would boost present refining capacity of about 40,000 bbl. daily to at least 80,000 bbl. He added that the board would consider requests for the remainder of the program — contemplating production of 120,000 bbl. daily by 1943 — as soon as the first 40,000-bbl. increased production is achieved.

"Generally speaking," Mr. Gary said, "everyone in the Government is agreed that these plants should be built and built quickly. We are working now on a mandatory construction schedule to secure delivery of materials as required."

Pointing out that it would require 8 or 10 months for new plants to go "on stream," Mr. Gary told the refining experts that measures must be taken in the interim to assure availability of a minimum of 60,000 bbl. of 100-octane motor fuel daily during the first 6 months of 1942.

Suggested Possibilities

Possibilities suggesting themselves, he said, include using a 4-cc. lead mixture instead of one of 3 cc., as now; increasing the output of blending agents; using isopentanes in all blends and arranging for a more efficient use of base stocks.

The possibility of some one government agency purchasing the nation's entire output of 100-octane fuel on a 3-year-term contract basis until facilities can be enlarged also was discussed with the group by Mr. Gary. He explained that this would benefit both the Government and the industry by assuring adequate supply for the Army and Navy and at the same time guarantee refiners a long-term market for their product. Committee members were requested to study this possibility and to make known their views to the OPC.

Present at the conference, in addition to members of the refining division staff, were the following industry representatives:

From District 1: Arthur E. Pew, Sun Oil Co., Philadelphia, Pa.; T. W. Moore, Standard Oil Co. of New Jersey, Elizabeth, N. J.; H. W. Field, Atlantic Refining Co., Philadelphia; Chester F. Smith and H. G. Burks, Jr., Standard Oil Co. of New Jersey, New York.

From District 2: Walter Miller, Continental Oil Co.; Bruce K. Brown and J. K. Roberts, Standard Oil Co. of Indiana, Chicago.

From District 3: Hines H. Baker and H. D. Wilde, Humble Oil & Refining Co., Houston, Tex.; H. B. Chamberlain, Magnolia Petroleum Co., Beaumont, Tex.

From District 4: H. S. McCray, Texas Co., Sunburst, Mont.; D. F. Gerstenberger, Inland Empire Refinery, Spokane, Wash.; R. W. Leslie, Wasatch Oil Refining Co. and Idaho Refining Co., Salt Lake City, Utah, and V. Stapleton, Texas Co., New York.

From District 5: J. L. Hanna and J. C. Stirton, Standard Oil Co. of California, San Francisco.

Priority ratings of A-1-a and A-1-c have been granted by Priorities Director Donald M. Nelson for the construction of seven new plants for the production of 100-octane aviation gasoline and of the base stock and blending agents used in the making of that fuel.

Ickes Warns Against Bottleneck

Pointing out that the deficiency in refining facilities for 100-octane fuel is likely to have a corollary effect upon the manufacture of high-test automobile gasoline, Mr. Ickes stated that this country is now running into a "general bottleneck" in refinery capacity which is rapidly becoming serious.

"A refinery shortage is now appearing," he said, "and if we are unable to obtain more refining facilities, the whole country might face a shortage of petroleum products."

He added that if a refinery shortage is permitted to develop it would be the most serious threat in the entire petroleum situation. American refineries are now operating at from 94 to 95 per cent of theoretical capacity, Mr. Ickes said, explaining that greatly increased demands for 100-octane fuel both for export to Great Britain and Russia, as well as large demands of the Army and the Navy have caused the present grave situation. Issuance of the new priority ratings, on the recommendation of the OPC, practically eliminates a backlog of project applications which had accumulated during recent weeks. According to Mr. Ickes, this action clears the way for final, rapid consideration of plans to triple the nation's 100-octane refining capacity from approximately 40,000 to 120,000 bbl. daily. Conferences are still being held with the Reconstruction Finance Corporation on methods of financing additional new plants and methods of providing term contracts for their output.

The plants on which priority ratings have just been granted and the product to be manufactured in each plant, which is designed to fit into the program for tripling capacity, are as follows: Union Oil Co., Wilmington, Calif., isopentane; Shell Oil Co., Inc., Wilmington, Calif., isopentane; Shell Oil Co., Inc., Houston, Tex.; hydrocodimer; La Gloria Corp., Corpus Christi, Tex., isobutane; Shell Oil Co., Inc., Wood River, Ill., isopentane; Phillips Petroleum Corp., Borger, Tex., 100-octane gasoline; Gulf Refining Co., Port Arthur, Tex., base stock.

In addition to these seven plants, the OPM also has issued priorities certificates to the Shell Development Co. for erection of a pilot-testing plant at Emoryville, Calif.

Aviation-gasoline plants already building for which project priority ratings had been granted earlier, or for which materials were obtained without preference ratings, are as follows: Shell Oil Co., Inc., Norco, La.; Standard Oil Co. of Ohio, Toledo, Ohio; Standard Oil Co. of Indiana, Whiting, Ind.; the Texas Co. and Gulf Refining Co., Port Arthur, Tex.; Standard Oil Co. of California, El Segundo, Calif., Tide Water Associated Oil Co., Avon, Calif.; and Humble Oil & Refining Co., Baytown, Tex.

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100-Octane Capacity 43,278 Bbl.

WASHINGTON, D. C., Oct. 21.—The impending shortage of refining capacity for production of 100-octane gasoline cannot be entirely eliminated by January 1, 1943, it was revealed today as the result of a survey of the situation just completed by the Office of the Petroleum Coordinator.

Coordinator Harold L. Ickes recently placed the needs of this country for 100-octane aviation fuel for the Army, Navy, and for the aid to England and Russia, at 120,000 bbl. daily by the end of 1942.

However, the survey shows that this goal will not be reached by that date.

According to the study, present capacity for the refining of 100-octane fuel is 43,278 bbl. daily. Additional refining capacity now under construction will increase this figure by the first of next year to 45,835 bbl. per day. Projected refinery expansion, the financing of which has already been planned, will add 11,994 bbl. to the figure, bringing it to a total of 57,994 bbl. daily as of January 1, 1943. A minimum of 100,000 bbl. daily will be necessary at that time, the survey showed. Potential additional capacity of 41,688 bbl. daily was discovered during the course of the OPC's study. However, this could be available only through the willingness and ability of the refining branch of the industry to cooperate fully in further expanding their facilities. Most of this additional capacity could be built, according to the survey, if the refiners can get materials and are willing to cooperate.

The survey also shows that there is a possibility of obtaining another 3,000 bbl. of capacity through improving the quality of base stocks. Totaling all of these possibilities, the maximum output of 100-octane gasoline by January 1, 1943, would be 102,517 bbl. daily, or 17,483 bbl. per day less than the capacity desired by Mr. Ickes.

Rare scenery is in store for A.P.I. travelers going west on The Oil and Gas Journal's special streamliners

Scenery and Speed Are Dual Attractions of Journal Special

WITH the opening of the twenty-second annual meeting of the A.P.I. only a week and a half away, enough reservations have been received to indicate that the meeting will be attended by a near-bumper list of oil men from all over the country. The officers of the Institute report that everything is in readiness for the meeting, and that California is waiting to extend an old time western welcome to the visitors who will gather in the city of the Golden Gate.

In previous years it has been the pleasure of The Oil and Gas Journal to plan and undertake operation of special trains to West Coast A.P.I. conventions, and for the 1941 convention the Journal has planned special streamliners equal to America's finest. The special streamliners will combine the deluxe features of the famous Santa Fe Chief and Super Chief.

After having considered very carefully all western routes to San Francisco, the Journal selected the Santa Fe route and planned swift, streamlined schedules along the scenic Santa Fe Trail. One train will leave Chicago and another will leave Tulsa, and already some 200 reservations have been received for the two trains. The trains will meet at Newton, Kans., and will proceed from that point as two sections to San Francisco, passing en route some of the most beautiful scenery in the United States. The Chicago section will leave that city at 11:45 a.m., Friday, October 31, and the Tulsa section will leave the Oil Capital at 4 p.m., Friday. The trains will arrive in San Francisco at 9 a.m., Sunday.

Because of the large number of oil men from other sections of the country who will attend the American Petroleum Institute's twenty-second annual convention in San Francisco, the California oil fraternity has planned an unusually extensive program of entertainment. George D. Gavin, of Tide Water Associated Oil Co., San Francisco, is chairman of the general entertainment committee, but the oil men themselves will find time between general and technical sessions for trips, cruises and other events. The committee will open information booths in both the Palace and St. Francis hotels, and will also mail to all members of the Institute a brochure giving the details of the program. An abstract of the attractions follows:

Saturday, November 1: Football, Stanford University vs. Santa Clara University; Sunday, November 2: St. Mary's vs. Gonzaga; November 3: Sightseeing tour of San Francisco area and reception at Mark Hopkins Hotel; Tuesday, November 4: Sightseeing tour, and luncheon at Bohemian Club for Institute officers and directors, and cruise of Chinatown; Wednesday, November 5: Sightseeing tour of San Francisco area, fashion review and tea at Fairmont Hotel Plunge, cruise of Chinatown; Thursday, November 6: Sightseeing tour of San Francisco Bay, ferryboat cruise, ladies banquet at St. Francis Yacht Club; Friday, November 7: Handicap golf tournament at Olympic Club Lakeside Course, and Saturday, November 8: Football, University of California vs. University of Washington, at Berkeley. Golf and tennis privileges will be available daily at several San Francisco clubs.

DEATHS

JOHN LEWIS ANDERSON, 66, retired oil operator, Baton Rouge, La., died last Saturday from a stroke of paralysis. Mr. Anderson resided in Shreveport for 15 years before moving to Baton Rouge. He is survived by his widow, a daughter and five sons.

FRANK MATTHEW BLACKWELL, 91, who was with Guffey Oil Co. when it developed the Spindletop oil field, died last week at La Porte, Tex. Mr. Blackwell was for 34 years associated with Gulf Pipe Line Co.

ROBERT M. CRIDER, 53, who had been in the production department of Gulf Oil Co. since 1922, died last week at his home in McPherson, Kans. Mr. Crider was a field man for Gulf at several Oklahoma fields, and worked out of the Tulsa office for several years. His widow survives.

FRANK E. HAMILTON, 76, who was for many years superintendent of the Bessemer Pipe Line Co., a subsidiary of Cities Service, died at a Titusville, Pa., hospital last week following a short illness. He had been in the oil business for more than 50 years. Two sons and a daughter survive.

EARLE W. HODGES, 59, public-relations director for Cities Service Oil Co., died in New York City last week. Mr. Hodges was at one time secretary of state for Arkansas, and had also served as president of Lions International. Death was caused by a heart attack.

SAMUEL N. HAWKES, who retired from the legal department of Cities Service Oil Co. at Bartlesville, Okla., died October 13 at his home in Bartlesville. Mr. Hawkes was an assistant attorney general of Kansas for 10 years before moving to Oklahoma.

Atlantic Marine Terminal Goes Into Service

PHILADELPHIA, Pa.—The new $1,500,000 marine terminal of Atlantic Refining Co. at Fort Mifflin on the Delaware River, adjoining the Philadelphia Airport, went into service last week when the Atlantic tanker Robert C. Tuttle tied up at the dock to discharge the cargo of 155,000 bbl. of crude oil from Port Arthur, Tex.

The Fort Mifflin terminal embraces a big cargo discharge stock, four storage tanks, pumping equipment, and two 16-in. pipe lines leading to the Point Breeze refinery 5 miles distant, and a large administration building. The dock eventually will be capable of accommodating three of the company's 540-ft. tankers at one time. The shore tanks have a capacity of 80,000 bbl. each and thus can accommodate the cargoes of two of the large tankers.

Offices of the marine department are at the terminal. There are also facilities for repairs, for provisioning of ships, and accommodations for officers and seamen.

THE MARKETS*

CRUDE OIL: Two minor moves were reported in the crude market. An advance of approximately 2 cents per barrel was posted October 16 by two buyers in the Caddo (Louisiana) field, lifting crude from that area to a par with Rodessa prices. Reports of premiums paid by purchasers continue at various points and the support of new organizations was thrown behind the movement to increase crude-oil prices. The District 2 production committee urged higher prices to forestall premature abandonment of small wells.

REFINERY PRODUCTS: Prices in most sections are firm and still threatening to move higher. Purchases on the Gulf Coast for lend-lease requirements have been consummated at higher prices. Eastern refiners are still waiting for a decision on the wax-price question, which is under consideration by the Office of Price Administration.

TANK WAGON AND POSTED DEALER: Tank-wagon prices for fuel oil are slightly higher in some of the northern states, but this movement is mostly an adjustment on the low side of the market, reflecting the seasonal habit of cut-price dealers to elevate their quotations in line with more stable sources of supply.

FINANCIAL: Oil securities sold lower this week. Average for 30 representative stocks for week ended October 18: High, 25.96; low, 25.06; close, 25.47. Week ended October 11: High, 26.32; low, 25.49; close, 25.84.

*Detailed information in the Market Section.

PROGRAMS AND MEETINGS

C.N.G.A. Synchronizes Meeting With Annual A.P.I. Session

The California Natural Gasoline Association's sixteenth annual fall all-day technical meeting is scheduled this year October 31, just a few days before the annual convention of American Petroleum Institute which will convene in San Francisco on November 3. In anticipation of substantial attendance by men also going to the A.P.I. meeting special plans have been made, particularly with reference to the subject material which will feature this year's meeting.

W. C. DAYHUFF

The meeting, divided into morning, afternoon and evening sessions, will be held in the Ambassador Hotel, Los Angeles, Calif., with registration at 9 a.m. W. C. Dayhuff, association president, will review the association's relationship to the industry and report on the accomplishments during the year. This will be followed by a report of the chairman of the general technical committee covering that body's work and reports by the chairmen of two of the subtechnical committees. These reports will include "Investigation of Standard Methods for Compressor Horsepower Calculations" by Tom Dunlap, Standard Oil Co. of California, and "Studies in Standardization of Gaging Methods for the Shipping of Liquid Petroleum Products by Vehicular Units" by W. B. Parks, the Norwalk Co.

The first paper of the meeting will be presented by E. R. Smoley, the Lummus Co., titled "Polyform Process," a discussion of the new polyform cycle and its relation to the utilization of light ends from natural gasoline. The paper will present new pilot-plant data on California stocks, giving yield-octane relationships and economic data. George P. Bunn and Wallace Williams, Phillips Petroleum Co., will present "Human Engineering in the Petroleum Industry." In modern industry technical developments cannot proceed at a pace greater than the development of men employing them and the sociological advances of the petroleum industry form the basis for this paper. "Partial Volume and Its Significance" is the title of a paper coauthored by Dr. B. H. Sage and Dr. William N. Lacey, California Institute of Technology, the partial volume being a property of a component in a mixture relating to its total volume. The paper will define the property and discuss methods by which it can be evaluated in relation to the prevailing conditions under which the mixture exists. A resume of the available information concerning the partial volumes of the lighter hydrocarbons will be presented. The utility of these data in the prediction of behavior of natural gases and gasolines will be discussed and some facts will be offered to indicate the present accuracy of prediction. "Analysis of Hydrocarbon Gas Mixtures by Mass Spectrometry," a paper coauthored by Herbert Hoover, Jr., and Harold Washburn of the United Geophysical Co., will present latest developments in this field. P. C. Dixon of Foran, Boatright & Dixon will present "Natural Gasoline Plant Practice as Applied to Cycling" which will deal with location and completion of wells, reservoir efficiency, operation of wells as a part of the plant, selection of material, design and operation of various plant units, selection and care of absorption oil and operation of field lines. Pertinent and timely is "The Importance of Natural Gasoline in National Defense" which will be presented by a representative of the petroleum coordinator's office, Washington, D. C.

Already the association has received word that many planning to attend the A.P.I. convention from the Mid-Continent and East are routing themselves via Los Angeles in order to participate in the C.N.G.A. fall meeting.

Varied Program Planned for A.I.M.E. Meeting in Los Angeles

The complete program for the meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers has been announced, and is shown here. A particularly wide variety of topics will be considered and it is expected that an unusually large number of people will attend the sessions. Not included here is the program of the Thursday afternoon forum session, which was published in full in The Oil and Gas Journal issue of September 18, Page 80.

Wednesday, October 29

7 a.m.—Breakfast meeting for authors, presiding officers of the day and division officials.

8:30 a.m.—Registration of members and guests.

Technical Session

9:30 a.m.—W. H. Geis, chairman; Howard Pyle vice chairman.

1. "Geologic Setting for the Occurrence of Oil in California," by H. W. Hoots, chief geologist, Richfield Oil Corp.

2. "Completion and Recompletion Practices Related to Well Productivity," by W. J. Travers, Jr., division superintendent, northern division, Richfield Oil Corp.

3. "A Program of Utilization of Natural Gas—California," by Ray L. Riley, commissioner, California State Railroad Commission.

4. "How the Small Operator Can Use Good Engineering Practice," by Ernest N. Merrill, consulting petroleum engineer and oil operator.

2 p.m.—E. K. Parks, chairman; Carlton Beal, vice chairman.

1. "Productivity of Oil Wells and Inherent Influences of Gas-Oil Ratios and Water Saturation," by R. V. Higgins, petroleum engineer, U. S. Bureau of Mines.

2. "The Young Petroleum Engineer and His Future in the Corporate Enterprise," by F. R. Schmeider, division manager, coastal division, Shell Oil Co., Inc., of California.

3. "Sound Engineering Technology," by Eugene A. Stephenson, chairman, Petroleum Division, A.I.M.E., and professor of petroleum engineering, University of Kansas.

4. "Field Application of Depth Pressure and Core-Analysis Methods to the Determination of Mean Effective Sand Permeability," by N. van Wingin, production engineer, northern division, Richfield Oil Corp.

5. "The Density of Crude Oils Saturated With Natural Gas," by Marshall B. Standing, assistant petroleum engineer, Standard Oil Co. of California, and Donald L. Katz, assistant professor of chemical engineering, University of Michigan.

7 p.m.—Informal dinner and smoker. This dinner is sponsored by the Southern California section—Victor H. Wilhelm, chairman, Southern California section, presiding; John R. Suman, president, A.I.M.E., principal speaker.

Thursday, October 30

7 a.m.—Breakfast meeting for authors, presiding officers of technical sessions and division officials.

9:30 a.m.—C. P. Watson, chairman; E. G. Trostel, R. W. French, vice chairmen. Sponsored by the Junior division, Southern California section.

1. "Factors Influencing the Electrical Resistivity of Drilling Muds," by John E. Sherborne, petroleum engineer, and William N. Newton, research engineer, Union Oil Co. of California.

2. "Core Saturation Research at University of Southern California," by Russell Wade, engineer's assistant, Union Oil Co. of California, and Lt. F. L. Ruhlman, N.S.N.

3. "Portable Drilling Rig," by T. A. Atkinson, drilling engineer, General Petroleum Corp.

4. "Development in the Del Valle Field," by Dean Sheldon, petroleum engineer, R. E. Havenstrite, operator.

8 p.m.—Cocoanut Grove, Ambassador Hotel. Informal dinner dance for members and guests.

CALENDAR

October

SOCIETY OF AUTOMOTIVE ENGINEERS, national fuels and lubricants meeting, Mayo Hotel, Tulsa, October 23-24.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Southern California section, Los Angeles, Calif., October 29-30.

SOCIETY OF AUTOMOTIVE ENGINEERS, national aircraft production meeting, Biltmore Hotel, Los Angeles, Calif., October 30-November 1.

CALIFORNIA NATURAL GASOLINE ASSOCIATION, Los Angeles, Calif., October 31.

November

AMERICAN PETROLEUM INSTITUTE, twenty-second annual meeting, St. Francis and Palace Hotels, San Francisco, Calif., November 3-7.

SOCIETY OF AUTOMOTIVE ENGINEERS, West Coast transportation and maintenance meeting, San Francisco, Calif., November 5-6.

AMERICAN ASSOCIATION OF OIL-WELL DRILLING CONTRACTORS, first annual meeting, Dallas, Tex., November 13-14.

SOCIETY OF AUTOMOTIVE ENGINEERS, natiinal transportation and maintenance meeting. Statler Hotel, Cleveland, Ohio, November 13-14.

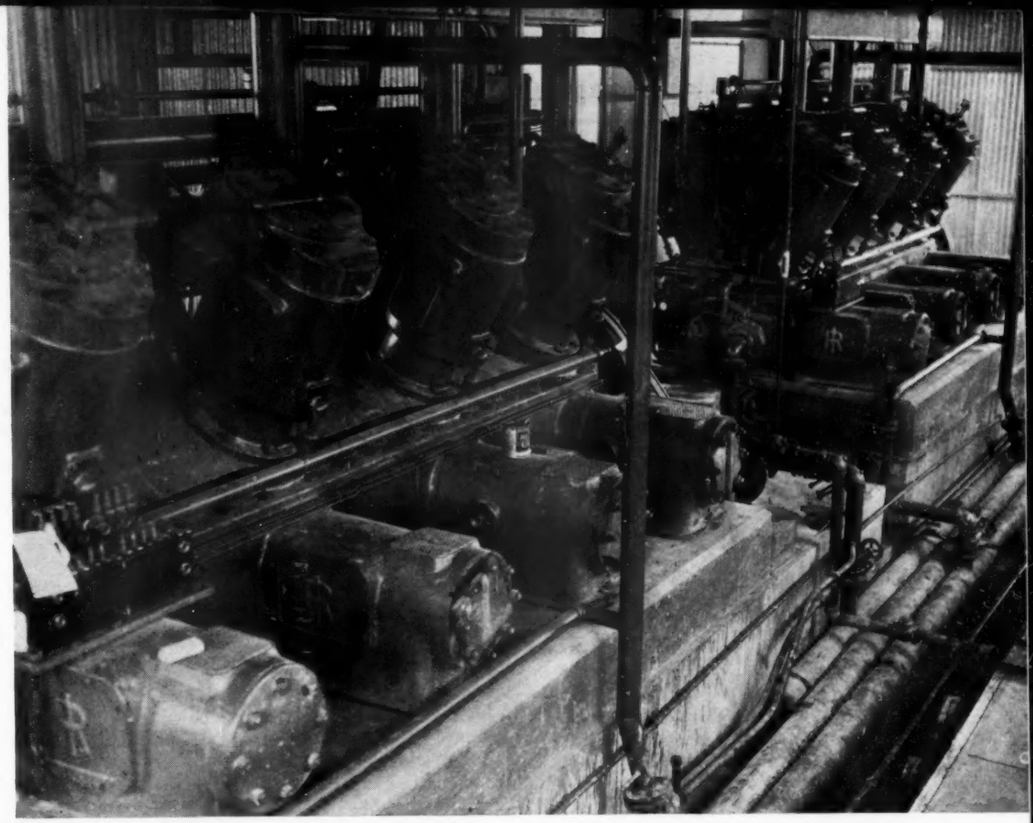
December

EXPOSITION OF CHEMICAL INDUSTRIES, eighth annual meeting, Grand Central Palace, New York, December 1-6.

NEW MEXICO OIL AND GAS ASSOCIATION, Artesia, N. M., December 3.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, Southeastern district meeting, New Orleans, La., December 3-5.

OKLAHOMA STRIPPER WELL ASSOCIATION, Tulsa, December 5.



Two eight-cylinder, three-stage angle-type compressors used for repressuring a pool in West Central Texas. The compressors handle approximately 3,000,000 cu. ft. at an intake pressure of 10 lb. per sq. in and a discharge pressure of 1,500 lb. per sq. in.

ENGINEERING & OPERATION

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OCTOBER 23, 1941

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Size of holes drilled and casing used have become progressively smaller with one company using a 6¾-in. hole and 4½-in. casing almost exclusively in its Mid-Continent operations.

INCREASING CAPACITY FROM OLD OIL HEATERS IN REFINERIES
By Robert Reed ..... Page 34
Stepping up refinery output is often the solution to the problem of making a refinery pay dividends. Remodeling old heaters with a minimum expense is one method of accomplishing this objective.

SULFUR COMPOUNDS IN PETROLEUM AND ITS DISTILLATES
By Harold Bottomley ..... Page 37
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ALTERNATIVE AND AUXILIARY FUELS FROM LIQUEFIED PETROLEUM GASES
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SHELL USING STEAM-OPERATED PIPE TONGS AT CALIFORNIA RIG
By T. P. Sanders ..... Page 48
Steam-driven, gear-operated tongs are being used by a major company for making up casing used for drill pipe on California wells.

FILTRATION FORMATION CEMENTING OF LOW GAS-OIL RATIO WELLS
By J. I. Laudermilk ..... Page 56
Shutting off of bottom-hole water can often be effected by the use of filtration cementing which requires little equipment and which can be accomplished at little cost.

REFINERY IDEAS THAT SAVE $$$$ ..... Page 40
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Slim-Hole Drilling Develops Changes in Technique

By HARRY F. SIMONS

SLIM-HOLE drilling, which has been progressing rapidly during the past 5 years, has brought with it changes in drilling technique as well as introducing a new type of rotary rig. Pioneer in this work has been the Shell Oil Co., Inc., which has successively reduced the hole and casing size in its wells to 6¾ to 4½ in., respectively. Company engineers have had to solve numerous problems which arose following the departure from the normal drilling practices.

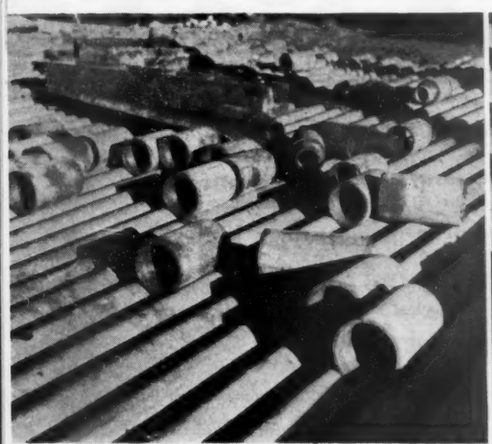
Rigs used by Shell in the Mid-Continent and Illinois are completely unitized on a single truck. The rigs being used at present in the drilling of the East Cromwell extension of Okfuskee County, Oklahoma, are typical. Average time for the drilling of the 3,500-ft. wells in the field with the slim-hole rig has been 14 days on and off. There has not been enough drilling in the area by other rigs to afford a direct comparison, but the rate of penetration with both the slim-hole and the standard-size rigs has been observed to be practically the same. In other words, the slim-hole rigs make practically the same progress while drilling but have a definite time advantage in tearing down, moving and rigging up.

Comparing slim-hole operations with big-hole drilling is difficult because of the large number of factors which must be evaluated. As the slim-hole rigs being discussed are company operated, they have a definite schedule laid out and a rig never has to wait on a location but moves directly to it as soon as the pay string of pipe is set. This is in contrast to the contract rig which is generally torn down and temporarily racked while waiting for a location. The divergence in the operation does not end there but extends to the overhead and investment charges which are substantially higher for the contractor. A general comparison of the operating end can be and has been made by many of the companies and shows that when competently operated the slim-hole rigs have no disadvantage while drilling and have a definite advantage in moving, operating, labor, bit and casing costs.

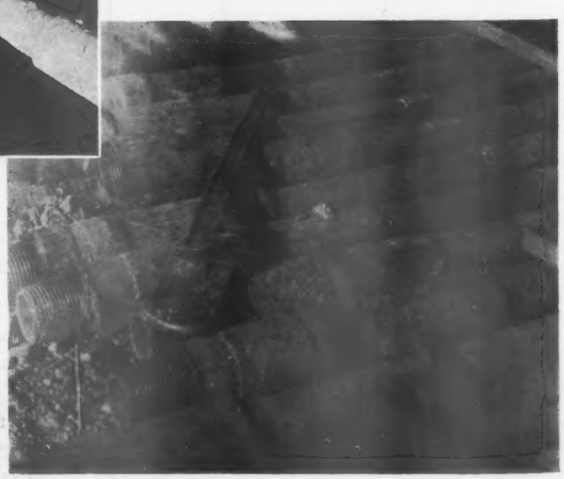
Two of the rigs used in the East Cromwell field are equipped with 84-ft. derricks and two of them have 58-ft. derricks. The latter can be raised in 5 minutes after the unit has arrived at the location and the blocks remain strung while moving. It takes approximately 1 hour to bolt the top half of the 84-ft. derrick to the bottom portion which is attached to the raising mechanism and which remains on the truck, and then raise the derrick. The blocks have to be strung each time. The taller derricks more than justify the additional rigging-up time as at 3,500 ft. it takes only 2½ hours to make a trip, while on the shorter masts trips require 3½ hours. As it requires from 12 to 15 bits to make the hole, 7 to 10 hours are cut from the operating time on each well by using the taller derricks. Later-model rigs of the same type can carry the 84-ft. derricks in the field and require only a few minutes longer to raise than the single masts.

Engines used to drive the rigs include the six-cylinder, 125-hp. diesel engine under the hood of the truck and a similar engine mounted on the truck bed. Each is equipped with its own radiator. These engines can be compounded or run separately. Operated at 1,200 to 1,750 r.p.m., the average fuel consumption of the two engines is 150 gal. per day. The units include two pumps each 5 by 8 in. which can be run together or separately. In drilling the small-diameter holes, generally both pumps are used, but circulation can be maintained with one pump and the other used for mixing mud. A pump speed of 50 to 60 s.p.m. is used while drilling. The rotary table is shaft-driven from the unit, although it is mounted separately on its own stand. The stand is equipped with

When using double-pin (or double-box) pipe, each joint is turned around before running it in the well. Photograph shows drill pipe projecting through the rotary with pin up and the single about to be added with pin down. The double-box sub will connect the two



Above, left: Double-box and double-pin subs used for connecting double-pin and double-box pipe, respectively. Double-pin sub in center of photo has been built up with hard-facing metal. Boxes cannot be rebuilt because of warping.



Above, right: Double-pin 3½-in. drill pipe with double-box subs in place.

Right: Double-box 3½-in. drill pipe with double-pin subs in place

screw type jacks for leveling up after the rotary has been set on the mud sills. Speed used on the rotary table varies from 200 r.p.m. on top of the ground to 75 r.p.m. near the bottom of the hole. Variation of the rotary speed is more dependent on the type of bit used than on depth. However, in drilling the upper portion of the hole a bit with long teeth is employed, while a short-toothed bit is used for drilling the hard lower formations.

The hoist has two speeds on the drum which, coupled with the four speeds in the transmission, gives a total of eight speeds on the blocks. An unusual feature are the three catheads on the cathead shaft. An automatic cathead is located on the offside and a friction cathead on the driller's side; the third cathead is in the middle of the shaft and is the automatic spinning type used for making up drill pipe.

Trucks used for mounting the drilling equipment drive on all wheels and are equipped with duals on the front end instead of the usual single wheels. In this connection, it might be pointed out that all of the truck is not idle while drilling is in progress, the engine, transmission and frame replacing three of the important parts of the ordinary drilling rig. This leaves only the wheels, drive shafts, differentials and cab on which depreciation must be borne in exchange for a medium on which to move the unit.

String Four Lines

Drilling lines used on the truck-mounted rigs are ⅞ in. diameter and are purchased in 400-ft. lengths for the single derricks and 700-ft. lengths for the 84-ft. derricks. For drilling down to 3,000 ft. only four lines are strung through the blocks and for drilling to 4,500 ft. six lines are strung. The running of casing on the slim-hole wells requires the handling of less weight than drilling, as the 4½-in. casing weighs only 9.5 lb. per foot, whereas the drill pipe weighs 15.5 lb. per foot. Three to four wells are obtained from each line and if no fishing is necessary the life of a line may be extended to six or seven wells.

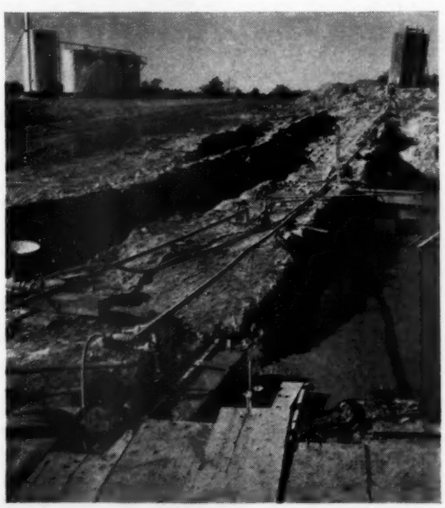
The working platform around the derrick is another illustration of the extent to which portability can go. Steel trestles made from old pipe are set on 3 by 12-in. boards and 8 by 10-in. timbers placed on top; the working platform is laid on the 8 by 10-in. sills and is attached to them. The walkway is laid on the ground with a 4-ft. ramp up to the platform.

As these rigs are generally operated without the usual sheds, special provisions must be made for storing of the crew's wearing apparel and the supplies. Waterproof chests, made from steel, are carried with each rig for this purpose. The dog house is located a few feet from the brake so the driller can escape from the weather. Other equipment carried with rigs include a 1,000-gal. fuel tank, a 100-bbl. water tank and a 5-kw. light plant driven by its own engine.

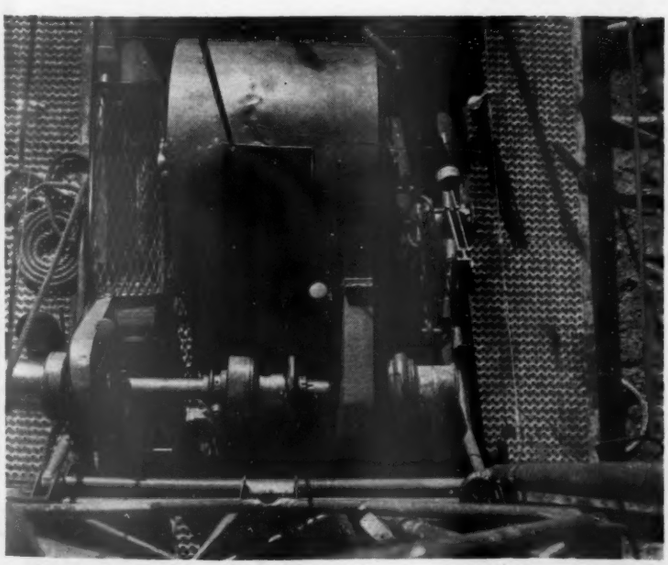
Pits Remain the Same

It might be expected that due to the smaller hole being drilled, (6¾ in.), the pits used for circulating the drilling fluid would also be reduced, but actually they are the same size as those used on larger holes. They are also designed to give the maximum of settling so that as little sand is circulated as is possible. In fact the drilling of the smaller holes places even a greater premium on mud conditioning and the very small added investment in adequate pits is more than justified. Generally double parallel pits, each approximately 12 ft. in width and 40 ft. in length, are used.

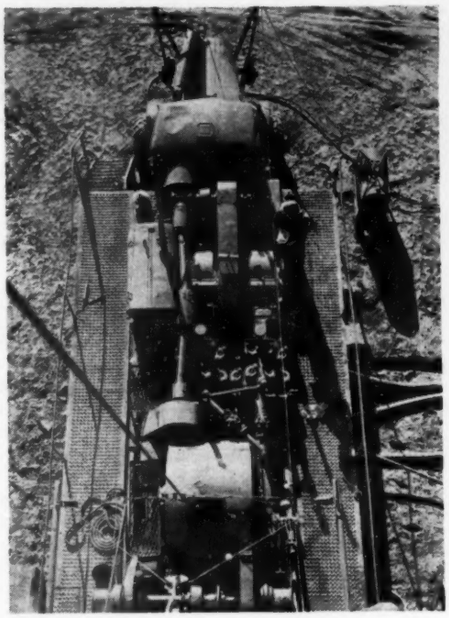
The drilling of the smaller holes has required considerable study to be made of the drill pipe used. Velocity of the mud stream makes it mandatory that the drill pipe be as free from friction as possible. Clearance between the drill pipe and the walls of the hole must be adequate for easy fishing and special provision must be made to reduce the amount and the cost of tool-joint wear.



Above: Pits used with truck-mounted portable rigs are the same size as those used with regular rigs



Left: Cathead shaft on portable rig shows regular cathead on left, automatic cathead on right and spinning-line cathead in the center



Layout of portable rig is shown strikingly in this photograph taken from open-face derrick

Selection of the present hole size of 6¾ in. is based on the latter two factors plus the fact that better service is obtained from the 6¾-in. rock bits. There is a reduction in the size of the bearings in the bit between the 6¾ and the 6¼-in. sizes and a locked cutter due to excessive bearing wear can easily cause the loss of the cutter in the hole. It was found that in many Mid-Continent fields the bearings in the 6¼-in. bits were worn before the cutters were in bad enough shape to warrant pulling. The 6¾-in. bits make but little more hole but they do it with less danger.

Drill pipe used is 3½ in., 15.5 lb. per foot, with external upset. Use of such pipe gives a drill stem with lessened internal restrictions and allows the mud to be moved at less pressure and greater velocity. The pressure shown on the mud-pump gage is not an important factor in slim-hole or any other drilling except as an indication to the amount of fluid passing through the bit and up the annulus. Variations in pressure are important.

The 3½-in. external upset pipe is equipped with oversize tool joints having an outside diameter of 5 in. Oversize joints are used as there is more contact between the tool joints and the walls of the hole in slim-hole drilling than there is in normal drilling. The extra metal in the oversize joint insures longer life before the joint must be replaced. If a 6¼-in. hole was drilled with standard-size joints (4¾ in. o.d.), the clearance would only be 1½ in. instead of 1¾ in. Use of internal-upset pipe would allow more clearance but would impose high pressures on the pump as the internal diameter of the tool joints is only 2$\frac{7}{16}$ in. against 2$\frac{1}{16}$ in. for the external-upset type.

Increasing the body of the tool joint ¼ in. by using the oversize joint has resulted in longer wear, but it was not entirely satisfactory and the effort to reduce cost of joint wear has led to the use of two other types of joints, one of which is quite different. Some of the pipe used in the East Cromwell pool has a box on each end of the pipe, the joints being coupled together by a double-pin sub. The oversize double-pin sub receives most of the wear as the boxes are standard size; as soon as the sub is worn down to the outside diameter of the boxes, it is sent to the shop for building up with hard-facing metal.

(Continued on Page 54)

Increasing Capacity From Old Oil Heaters in Refineries

By ROBERT REED
Engineer, John Zink Co., Tulsa

A LARGER volume of oil processed daily through a refinery is sometimes the solution to the problem of making a refinery pay. If this can be accomplished without installing more heaters and without increasing the plant personnel the position of the refiner is correspondingly improved. It is frequently possible to set up such a condition at relatively low cost and with a minimum of lost operating time. The engineering problems involved in converting an old heater for increased capacity are usually quite simple but a number of factors should be carefully considered.

These factors include: Charge and reflux pump capacity; tower design; combustion conditions and location of burners in the heater; effective transfer rates per square foot of tube surface; arrangement of tubes in the heater; material of which the tubes are made and the amount of heat transfer obtained in the convection section of the heater.

For increasing capacity, the refinery has two courses open to it. They are additional heating surface and modification of combustion conditions in the heater.

Requires Careful Engineering

The addition of tubes to an existing furnace is a project which is not only expensive but requires exceedingly careful engineering. The modification of existing combustion conditions can be accomplished at a much lower cost. Less downtime is necessary for such changes as may be required and the engineering problems involved are much less complex.

Until recently, refinery oil heaters were designed around a heat release of approximately 10,000 B.t.u. per cubic foot of combustion volume. This was considered an average and radiant transfer rates were set up accordingly. Modern practice in design runs in the neighborhood of 15,000 to 18,000 B.t.u. per cubic foot. This increase in heat density is due to improved tube metals and burner design. In fact, heaters are now operating satisfactorily with heat densities as high as 35,000 B.t.u. per cubic foot but such conditions are extreme and by no means average.

The furnace for a given release is much smaller now than it was 10 or even 5 years ago; yet relatively long runs have become accepted as the usual thing. The refiner is thus doubly served in that the first cost of the unit is lower and he can expect greater returns per year per dollar invested.

It is almost impossible to definitely separate the heat transferred by radiation and by convection in an oil heater. Under ideal conditions, with no flow of hot gases over the absorbing surface, the amount of heat to be obtained by radiation can be checked very closely.

By definition, convected transfer is to be obtained through the flow of gases over surfaces. It is a contact method. Radiant transfer requires no contact since the radiating medium may be at some distance from the absorbing medium. The amount of heat to be absorbed by pure radiation is a function of the distance the heat must travel. Calculations are based on the law that radiant heat decreases as the square of the distance between the radiant and absorbing bodies.

A major fault with the old heater design could, therefore, be traced directly to failure on the part of the designer to secure a maximum travel of hot gases as produced by the burners over the tubes in the heaters. This may be understood when it is remembered that flue gases very definitely have mass and exist in the furnace at high temperature. They are an excellent source of radiant heat in themselves and since they are in direct contact with the tubes, the decrease in available heat due to the distance between the radiant and absorbing bodies is very small. The flow of the hot gases over the tubes also brings the gases in close contact with the refractory behind the tubes. The temperature of the refractory is thus raised and the quantity of heat it can radiate is increased.

By getting the combustion gases into the tubes, cumulative benefits in the actual rates of heat transfer are to be realized. Both sides of the tube can be made to work more uniformly, also, while the net transfer per square foot of tube surface may be materially increased the tube is actually working no harder. Skin temperatures may be reduced to relieve the tendency to form local coke deposits and reduce the danger from oxidation.

Operators are familiar with the heat condition as shown in Fig. 1. It is a characteristic of the older heaters. Control thermocouples are usually placed directly over the bridge wall because it is there the highest temperatures exist. Tube damage and coking almost always are found in this zone and it is the practice of the operators to run the heater at the maximum permissible temperature at this area.

Corner Tubes Cold

Tube skin temperatures directly over the bridge wall may be higher than is really safe while the tubes in the corner of the heater directly above the burners and out to the center of the roof may be loafing. Over-all transfer rates may show 10,000 B.t.u. per square foot of tube surface are being absorbed. Actually the tubes over the bridge wall may be absorbing heat at a rate in excess of 20,000 B.t.u. per square foot while tubes in other parts of the furnace may be operating at rates more in the neighborhood of 5,000 B.t.u. per square foot.

Fig. 2 shows how modern burner design corrects the fault in heat distribution. Heat goes

(Continued on Page 38)

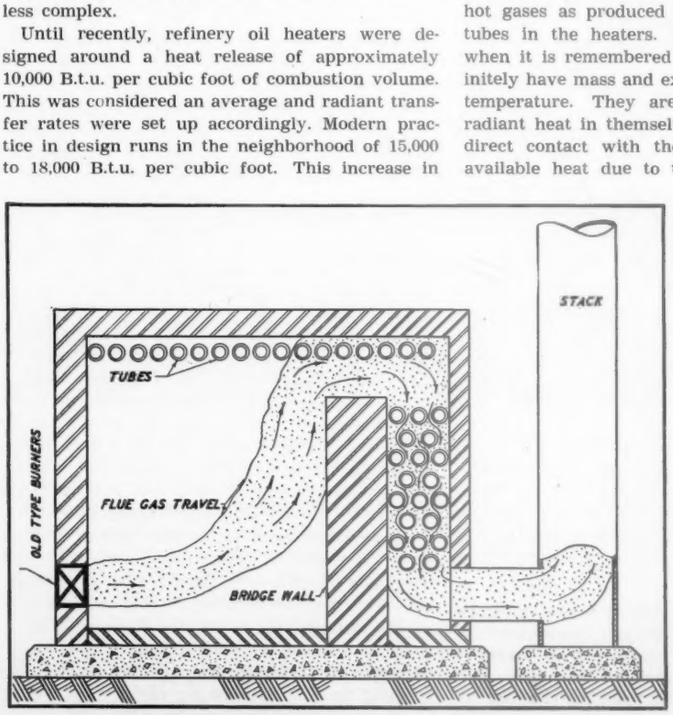


Fig. 1

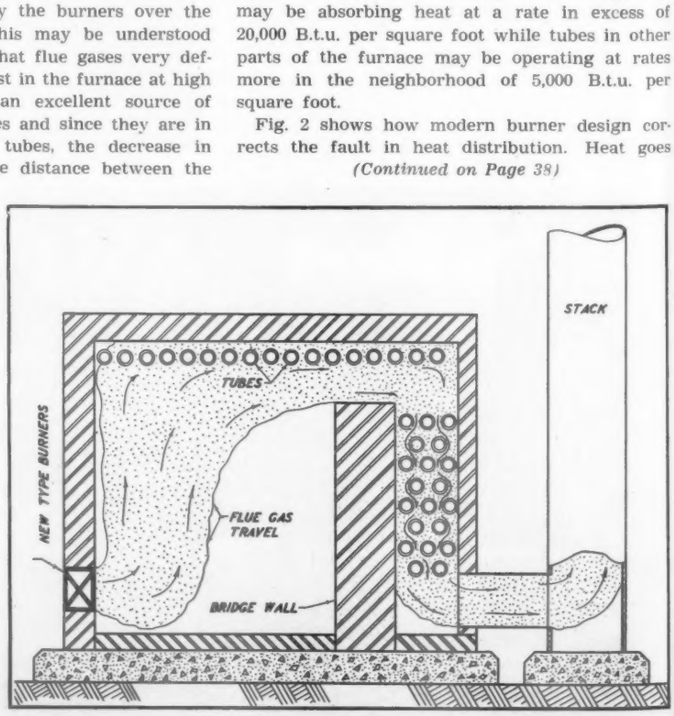


Fig. 2

Sulfur Compounds in Petroleum And Its Distillates

By HAROLD BOTTOMLEY
Chief Engineer, Cosden Petroleum Corp.*

Refiners, petroleum technologists and equipment companies are impartially studying all means for improving the octane value of gasoline. Of prime importance is the preparation of high-octane aviation gasolines which could easily lead to robbing the automotive fields of some antiknocking components. Any switch of this type can be equalized by the addition of tetraethyl lead but the degree of lead response varies greatly among gasolines. Therefore, in order to get the most out of the lead the chemical nature of the gasoline should be altered by chemical treatment in advance in order that it be most receptive. This represents true conservation. Since sulfur and its compounds have a depressing effect upon the responsiveness of tetraethyl lead their removal or conversion in form prompts timely study and here a valuable and timely series of tests is described to add to the practical suggestions already made available to refiners.

FORGETTING for the moment all statutory regulations governing the maximum permissible quantities of sulfur in gasolines, and other petroleum distillates, examples may now be quoted which emphasize the importance of the sulfur study. Paramount in importance is the relation of sulfur and its compounds on the effect of the addition of tetraethyl lead to gasolines. In these days of high compression ratios and higher octane-number requirements it behooves the refiner to obtain the maximum response from a given quantity of tetraethyl lead.

Schultz and Buell as early as 1935 recognized the economic importance of eliminating sulfur compounds from petroleum distillates and by viewing the subject objectively did important research on the problem. Their data, some of which are quoted here, indicated the relative importance of various sulfur compounds on tetraethyl lead response and graphically showed the increase in tetraethyl lead susceptibility to be obtained by desulfurization of various types of gasoline.

Deductions made from their data show the relative differences between the mercaptans, sulfides, disulfides and cyclic sulfur compounds as regards tetraethyl lead susceptibility. As they state, the refiner is mainly interested in saving tetraethyl lead regardless of how it is done.

Study of Synthetic Mixtures of Organic Sulfur Compounds and Gasoline

For the purpose of arriving at definite recommendations a program of laboratory investigation was performed using Eastman Kodak Co. organic sulfur compounds of the highest obtainable purity blended in certain percentages with gasoline of essentially no sulfur content. Attached tables delineate the various sulfur compounds used and the properties of the mixtures which were under investigation. Each sulfur compound was inspected and the properties of each appear in Table 1. It has not been proved to the author's entire satisfaction that each sulfur compound listed here appears in any or all gasolines but it goes without saying that if they were present the results should approximate the findings on the mixtures.

It appears that the first small increment of added sulfur affects the clear octane numbers to the greatest degree and that five times this amount makes no appreciable reduction in the octane number. However, the situation is far different as regards the response to tetraethyl lead addition and this is clearly shown in the data. From the data of this investigation it appears that no large difference can be noted between the effects of sulfides and disulfides below the C-5 group but for the *i*-amyl disulfide the break appears to widen. The cyclic disulfides are by far the worst offenders as indicated by these data. No marked difference appeared in the iso and *n*-butyl disulfide blends but did show up markedly with the C-5 disulfides.

It is interesting to note the extreme increase in boiling point of the corresponding mercaptans and disulfides. Methyl mercaptan boiling at 46° F. when sweetened converts to the disulfide boiling at 243° F. or well up into the gasoline boiling range. It may well be that it is this increase in boiling points of the converted mercaptans that gives rise to bad distillation flask corrosions on technical naphthas. Normal propyl mercaptan boiling at 154° F. will be partially retained in light solvent naphthas and after sweetening may become a residue in the distillation flask, with its disulfide boiling point of 377° F. At dry point temperatures this material will crack to yield volatile sulfur compounds that discolor copper avidly.

*Extended abstract of paper presented before technical regional meeting of Western Petroleum Refiners Association at Wichita, Kans., Oct. 3, 1941.

TABLE 1—PROPERTIES OF SOME ORGANIC SULFUR COMPOUNDS FOUND IN GASOLINES

Name—	Gravity A.P.I.	Boiling point, °F.	Color	Odor
Mercaptans:				
Methyl	31.5	46	Colorless	Offensive
Ethyl	37.0	94	Colorless	Offensive
n-Propyl	37.8	154	Colorless	Offensive
i-Propyl	44.2	140	Colorless	Offensive
n-Butyl	37.7	208	Colorless	Offensive
i-Butyl	37.8	190	Colorless	Offensive
n-Amyl	33.6	259	Colorless	Offensive
i-Amyl	38.0	246	Colorless	Offensive
Benzyl	2.2	383	Colorless	Offensive
Sulfides:				
Methyl	35.8	100	Colorless	Offensive
Ethyl	37.6	198	Colorless	Offensive
n-Propyl	42.3	286	Colorless	Mildly off.
i-Propyl	...	249	Colorless	Mildly off.
n-Butyl	37.2	360	Colorless	Mildly off.
i-Butyl	37.1	343	Colorless	Mildly off.
n-Amyl	...	...	Colorless	Inoff'sive
i-Amyl	36.3	410	Colorless	Inoff'sive
Benzyl	0.6	120 (MP)	Colorless	Inoff'sive
Phenyl	—5.3	565	Colorless	Inoff'sive
Thiophene	—1.5	183	Colorless	Inoff'sive
Disulfides:				
Methyl	2.4	243	Colorless	Mildly off.
Ethyl	11.0	308	Colorless	Inoff'sive
n-Propyl	...	377	Colorless	Inoff'sive
i-Propyl	...	...	Colorless	Inoff'sive
n-Butyl	...	212 (15 mm)	Colorless	Inoff'sive
i-Butyl	...	183 (10 mm)	Colorless	Inoff'sive
n-Amyl	...	264 (12 mm)	Colorless	Inoff'sive
i-Amyl	22.6	482	Colorless	Inoff'sive
Benzyl	...	160 (MP)	Colorless	Inoff'sive
Phenyl	...	142 (MP)	Colorless	Inoff'sive

Sulfur-Free Gasoline Used as Base Stock for Synthetic Blends

Gravity	58.3
Color	30
	°F.
I.B.P.	118
10 per cent	179
20 per cent	204
50 per cent	262
90 per cent	360
E.P.	405
Recovery, per cent	99
Doctor	Neg.
Corrosion	OK
Reid vapor pressure, pounds	1.5
Octane, M.M.	50.0
Plus 1 cc. TEL	63.5
Plus 2 cc. TEL	69.6
Plus 3 cc. TEL	73.8

TABLE 1-A—RESULTS OF 4-HOUR EXPOSURE TO SUNLIGHT ON BLENDS OF VARIOUS SULFUR COMPOUNDS, UNLEADED MATERIAL

	% of sulfur	Saybolt colors— Sulfides	Disulfides
Methyl	.01	30	30
	.03	30	30
	.05	30	30
Ethyl	.01	30	30
	.03	30	30
	.05	30	27
n-Propyl	.01	30	30
	.03	30	30
	.05	30	30
n-Butyl	.01	30	30
	.03	30	30
	.05	30	30
i-Butyl	.01	30	30
	.03	30	30
	.05	30	30
n-Amyl	.01	30	30
	.03	30	30
	.05	30	28
i-Amyl	.01	30	30
	.03	30	30
	.05	30	27
Benzyl	.01	30	30
	.03	30	30
	.05	30	30
Phenyl	.01	30	23
	.03	30	10
	.05	30	—2
Thiophene	.01	30	..
	.03	30	..
	.05	30	..

Economics of Sulfur Reduction

It is realized that this paper is being presented in a region where sulfur problems are less severe. In other sections of the United States where higher sulfur crudes are produced, the problem is most important.

There are several methods of accomplishing the removal of some of the sulfur types involved, each being fairly costly to operate per unit of sulfur removed; also each has its advantages and disadvantages. The list includes:

1. Multistage caustic wash.
2. Solutizer treatment.
3. Caustic-methanol extraction.
4. Hot-clay treatment and its variations.
5. Sulfuric acid treatment.

Of the five listed, the first three remove only mercaptans but operate effectively on both straightrun and cracked products. The fourth, hot clay, does an effective job on straightrun products but due to slight polymerization is limited in its application to cracked gasolines. Also, cyclic sulfur compounds are relatively unattacked by the hot-clay method, but mercaptans, sulfides and disulfides are decomposed to great extent.

Probably the most effective over-all sulfur removal agent is sulfuric acid but there again serious faults are present. In acid-treating any material containing olefinic hydrocarbons a large amount of polymerization takes place, producing polymers that must be removed by redistillation. However, acid treatment does remove some of

the cyclic sulfur compounds and practically all high-sulfur California gasoline is so treated, if treated at all for sulfur reduction. To remove sulfur in worthwhile quantities from petroleum distillates, relatively large quantities of acid are required, sometimes as high as 25 to 40 lb. per barrel on high sulfur-bearing gasolines. Initial octane loss is suffered by polymerization of the cracked components but oftentimes the over-all lead response is increased to the extent that this loss is minimized to a large extent.

The returns from desulfurization are appreciable. In Table 2 are shown the data derived from the application of several of the above-mentioned desulfurization methods as applied to West Texas, Yoakum County, straightrun gasoline.

It can be clearly seen from the foregoing data that the hot clay method's savings of tetraethyl lead will justify considerable thought when desulfurizing a gasoline of the type used in this illustration. The arbitrary level of 67.0 was used as a reference point because it is a level frequently leaded to in the U. S. Motor class. It would be meaningless to choose a higher level as the maximum tetraethyl lead concentration is exceeded in all cases except the hot clay when leading to contemporary "Q" octane requirements.

Another economic factor brought out by the above illustration is the importance of the diversion of this gasoline to house-brand quality if hot clay treated. This would amount to the price differential between the 67-octane grade on one hand and the 72-74 grade on the other.

In the preceding illustration the extraction processes did not show up especially well as regards over-all sulfur reduction and reduction in tetraethyl lead requirements, but as mentioned previously, this is only one gasoline and straightrun at that. Field shows the benefits to be gained by treating Michigan cracked gasoline with the caustic-methanol extraction process. No significant change was noted in the clear octane numbers but at the 3-cc. level the improvement was marked. The susceptibility factor increased from 0.75 to 1.04, a notable improvement. Other data from this article indicate similar results are to be obtained on widely differing gasolines.

Caustic scrubbing to remove mercaptans has been developed to high degree by the incorporation of efficient contact scrubbing and stripping towers. In one installation utilizing countercurrent caustic scrubbing of cracked gasoline in which towers packed with 1½-in. carbon Raschig rings are used, from 80 to 90 per cent mercaptan removal is effected in a single stage. The mercaptan scrubbing tower contains a bed of these carbon rings approximately 30 ft. deep and only 15 per cent by volume of 18 B. caustic is circulated to effect the removal cited above. In this installation the original mercaptan content varied from 0.145 to 0.155 per cent and the scrubbed gasoline contains only 0.15 to 0.030 per cent residual mercaptan. This caustic scrubber has greatly lessened the load on the doctor treating plant, as can be easily seen, and has more than justified its installation expense and current operating cost by reducing the amount of litharge that needs to be regenerated in the doctor recovery system. Other refineries, according to authoritative information, are obtaining comparable results.

TABLE 1-B—OCTANE NUMBERS (M.M.) OF SYNTHETIC SULFUR BLENDS

		Sulfides			Disulfides		
	Per cent of sulfur	Clear	1 cc. lead added	3 cc. lead added	Clear	1 cc. lead added	3 cc. lead added
Methyl	.01	48.8	62.2	72.7	48.7	62.7	73.9
	.03	48.6	61.7	71.7	48.6	61.4	71.6
	.05	48.4	61.2	70.2	48.4	60.5	69.8
Ethyl	.01	49.0	62.8	72.6	49.4	62.9	73.9
	.03	48.4	62.4	71.8	49.0	61.8	72.0
	.05	48.3	61.8	71.0	48.6	60.9	70.4
n-Propyl	.01	48.8	62.9	72.6	48.9	62.8	74.1
	.03	48.3	62.0	71.5	48.6	62.0	72.0
	.05	48.2	61.4	70.7	48.5	61.0	70.2
n-Butyl	.01	49.2	62.0	72.4	48.8	62.6	74.1
	.03	48.9	61.7	71.5	48.5	61.7	73.1
	.05	48.6	61.4	71.3	48.4	60.5	72.3
i-Butyl	.01	48.9	61.9	72.7	49.1	62.4	74.0
	.03	48.7	61.6	71.5	49.0	61.8	73.4
	.05	48.6	61.5	71.2	48.9	61.1	72.6
n-Amyl	.01	48.6	61.7	72.6	48.9	62.4	74.1
	.03	48.3	61.6	72.3	48.8	61.9	73.1
	.05	48.1	61.5	71.5	48.8	61.1	72.1
i-Amyl	.01	48.5	62.1	72.8	48.5	61.9	71.4
	.03	48.4	61.5	72.0	48.4	60.6	70.2
	.05	48.0	61.5	71.7	48.3	59.8	69.4
Benzyl	.01	48.5	62.2	73.0	48.2	62.3	71.6
	.03	48.1	61.7	72.2	48.0	60.8	70.7
	.05	48.0	61.1	71.7	48.0	60.0	69.7
Phenyl	.01	48.9	61.8	73.1	48.2	61.9	71.6
	.03	48.3	61.5	72.3	48.2	60.9	70.9
	.05	48.1	61.3	71.4	48.0	60.2	69.5
Thiophene	.01	49.0	62.4	72.1	...	...	...
	.03	48.7	62.3	71.5	...	...	...
	.05	48.7	62.1	71.2	...	...	...

Increasing Capacity From Old Oil Boilers in Refineries

(Continued from Page 34)

directly up the wall above the burners. Hot gases flow over the roof tubes and the heat absorption becomes more nearly even.

Burners based on the latest design flare their heat patterns rapidly and discharge their products of combustion at minimum forward velocity. Both the flaring and the low forward velocity permit the hot gases to rise quickly and enter the tube zone at considerable distance from the bridge wall. These characteristics make the location of burners firing over floor tubes of prime importance since if they are too close to the tubes heat impingement may result. Wall tubes directly above the burners should also be considered.

Much lower excess air rates may also be obtained with proper burners when they are correctly adjusted. Low excess air in the combustion gases in a heater produces high radiant heat transfer rates and saves a considerable amount of fuel. There are two reasons why this is true.

To begin with, low excess air in the combustion zone produces a high flame temperature. The gases leaving the combustion zone are hotter and can, therefore, radiate more heat. The same is true of the refractory over which the gases flow.

Water vapor and CO_2 are formed when gas or oil is burned. The lower the excess air in the products of combustion the higher the concentration of heat available to do work.

In addition to the benefits to be realized in the radiant section of the heater the sensible heat loss up the stack is reduced. Savings of from 5 per cent to as much as 10 per cent in fuel costs may be made by drastically reducing the excess air in the flue gases of a heater.

Where soaking sections, preheaters or steam superheaters are located in the convection section it is necessary to run enough excess air to get heat to them since the amount of heat they can absorb depends on the number of pounds of flue gas which flow over them.

It is interesting to note the results which have been obtained in increasing the capacity of oil heaters through simply modifying combustion conditions. In one heater, located on the Texas Gulf Coast, the volume of oil processed per day was doubled and the length of runs was materially increased. In another heater in the same area, the volume of oil processed was increased 25 per cent with a lower bridge wall temperature than before. In the St. Louis area a heater processed 35 per cent more oil per day with only a 20 per cent increase in the volume of fuel burned. Runs on a heater in West Texas were lengthened over 200 per cent and the throughput raised 30 per cent.

At this time there are a number of burners which are designed to get the most from a heater. It is usually well to get the opinions of several burner men as to what may be done and how to do it. Also, there is no such thing as one "best" burner for all applications.

TABLE 2—RESULTS WHEN USING VARIOUS METHODS

	None	3-stage caustic wash and dr. tr.	3-stage solutizer wash and dr. tr.	3-stage caustic methanol wash and dr. tr.	Cosden clay treat 700°F. 20 lb./sq.in. 1 S.V. NaOH sweetened
Mercaptan sulfur, per cent:					
Raw	.128	.128	.128	.128	.128
After high-temperature clay treat	...	...	...	...	.002
After first stage	...	.084	.021	.049	.000
After second stage	...	.077	.018	.020	..
After third stage	...	.071	.017	.017	..
Total sulfur, per cent	.300	.280	.210	.230	.050
Color, Saybolt	30	30	28	27	25
Bromine number	2	..	..	..	2
Copper dish gum, mg.	8	8	13	10	2
Octane number, M.M.	54.0	53.0	53.0	53.0	56.5
Plus 1 cc. TEL/gal.	61.0	60.0	61.5	60.5	67.0
Plus 2 cc. TEL/gal.	64.5	63.7	65.2	64.2	72.0
Plus 3 cc. TEL/gal.	67.0	66.0	68.0	67.0	75.0
Reid vapor pressure	5.0	4.9	4.7	4.6	4.5
A.P.I. gravity	57.5	57.4	57.4	57.4	57.4
I.B.P., °F.	120	116	121	124	122
5 per cent	156	152	158	158	160
10 per cent	171	167	174	176	174
50 per cent	250	249	252	251	248
90 per cent	339	341	344	343	339
95 per cent	363	368	369	367	364
End point	396	395	396	396	383
Mercaptan reduction, per cent before doctor tr.	...	44.5	86.7	86.7	100
Total sulfur reduction	...	6.7	30.0	23.3	83.4
TEL, cc./gal. saving to 67 M.M. O.N.	...	Neg.	0.2	None	2.0
Monetary saving per 1,000 bbl. of gasoline	...	...	$16.80	...	$168.00

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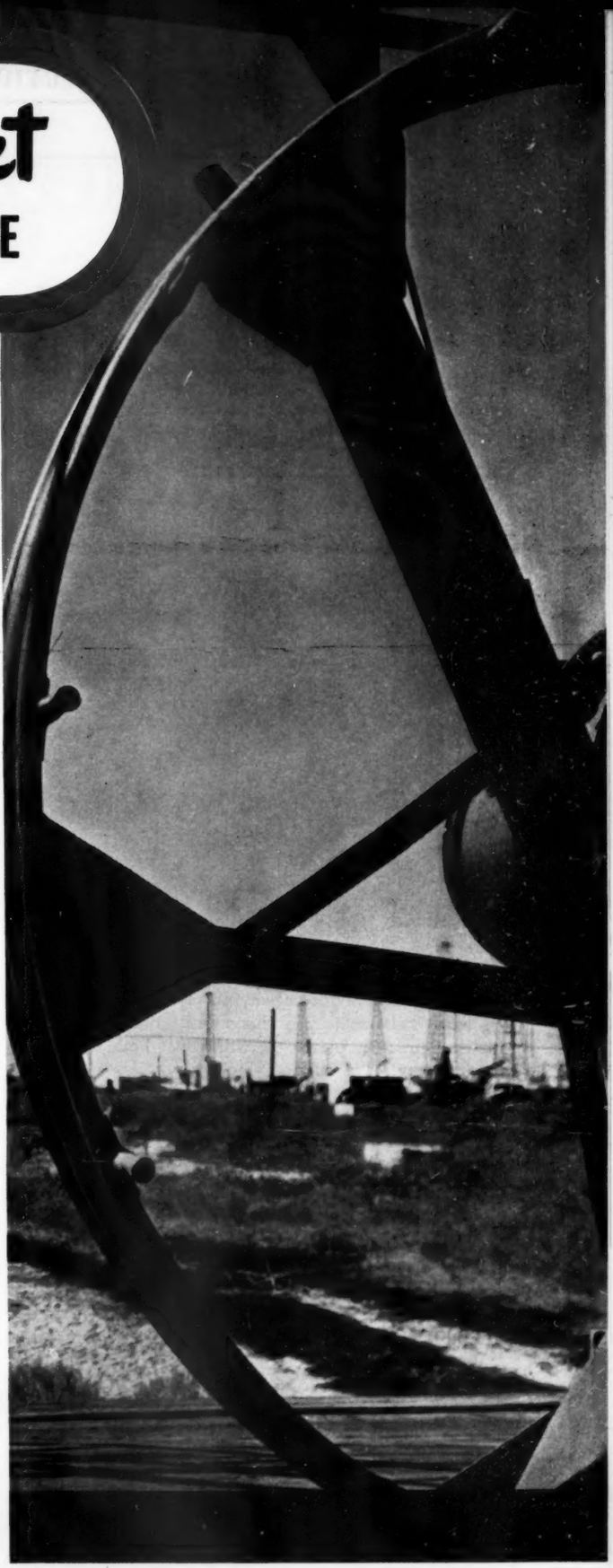

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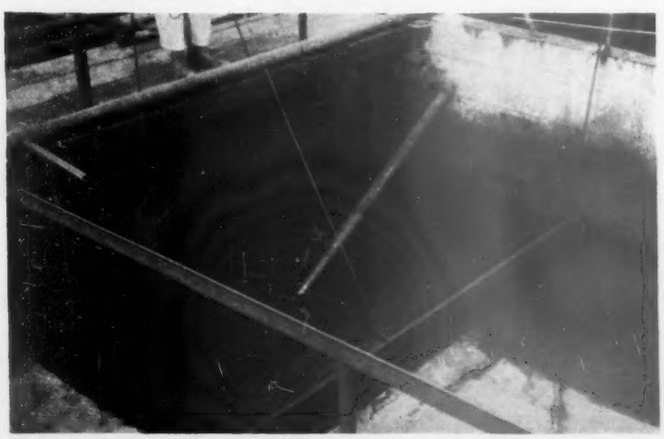
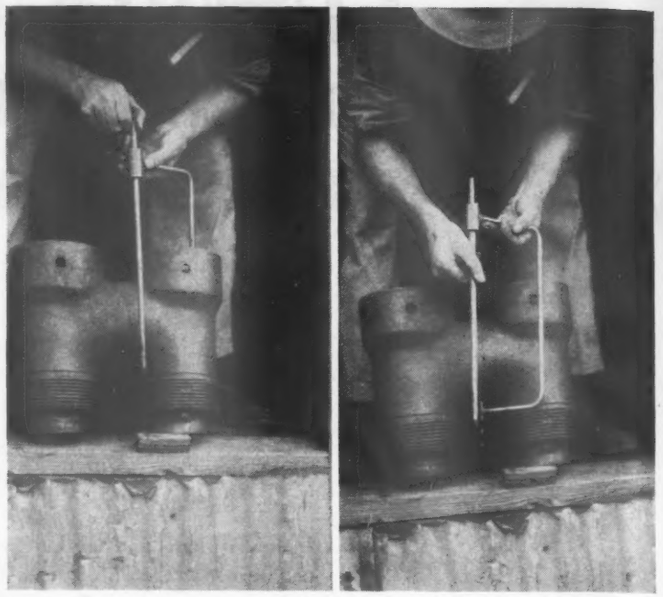
Assemble Roof Trusses

Old tubing can be used to advantage in making trusses for refinery buildings as the accompanying picture shows. This all-welded truss was made entirely of discarded tubing except for the angle irons and junction plates. It will effect both a savings in costs and conservation of needed steel.

Board Used to Skim Pond

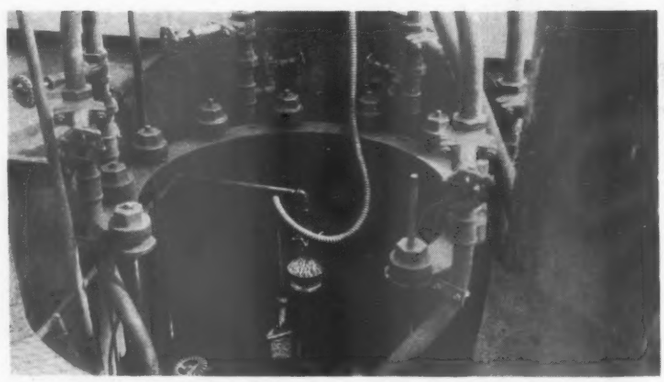
Oil film is removed from refinery waste water by a manually operated skimming board in this settling basin. The board, suspended from pulleys which run the length of the basin, may be raised or lowered by the lever shown at the upper left. The board is lowered into the basin at the end opposite the adjustable suction line. As the board is drawn across the basin it gathers the oil film in the vicinity of the suction line and it is pumped off.





Determine Wall Thickness

Wall thicknesses of tube turns are measured with this simple instrument. One measuring point is mounted on a rod and the other on a sleeve operating on the rod. The edge of the sleeve serves as an indicator measuring the thickness on a graduated scale on the rod. The picture at the left shows the instrument being used to measure the wall of a turn while that at the right shows it at the same relative position outside the turn. When the two measuring points are exactly opposed, markings on the rod and sleeve are in alignment.



Electric Spark Lights Heater

This electric ignition system, used on down-fired deFlorez cracking still heaters, has proved both a convenience and a safety measure. Fuel gas and electricity for the lighter are controlled from the same point on a lower walkway as the block valves on the main low-pressure fuel gas line thus enabling a single operator to light up. The system consists essentially of a ½-in. pipe line supplying fuel gas at about 15 lb. per sq. in. to a lighter tube which is permanently installed projecting through the lighting-up hole in the head of the burner. Holes in a cap at the top of this tube admit primary air for fan-damper settings for normal operation give sufficient draft above the throat to produce a strong down draft in the tube when the heater fire is out. Ignition is effected by a spark plug mounted in the side of the tube. High-voltage electric current is supplied by an ignition transformer which is mounted above the windbox. The assembly is chalked in this picture to provide contrast.

Alternative and Auxiliary Fuels From Liquefied Petroleum Gases

By C. GEORGE SEGELER
Engineer of Utilization, American Gas Association, New York City

The accompanying article is an extended digest of a paper presented before the Natural Gas Section at the annual meeting of the American Gas Association, Atlantic City, N. J., October 20, 1941. While it is directed toward the distributors of gas it is presented here because of its discussion of the properties of gases and because it presents to the producer of liquefied petroleum gases some of the problems in the utilization of these fuels.

ABOUT 25 gas utility companies are already using liquefied petroleum gases as alternative or supplementary gas supplies although 173 more communities in the United States are exclusively provided with some form of LP gas service. The small and select company of 25 gas utilities using LP gases is growing as fast as the technical hurdles of application can be crossed. An intensive study of this important phase of the gas business has just begun.

Seven broad objectives have prompted gas utility companies to make use of LP gas products. These are: (1) Rate schedules involving demand charges based upon the maximum daily requirements in addition to a total volume charge; (2) fluctuating supply such as those cases where the production of gas is related to the production of oil; (3) emergencies caused by an interruption of gas supplies; (4) possibility of unusually cold weather; (5) necessity of obtaining a quick supply during emergencies for companies serving a mixed manufactured and natural gas; (6) relieving the burden on gas-manufacturing plants which are already operating near peak load during normal consumption and which must have an auxiliary supply; and (7) building up of B.t.u. content at the end of long transmission lines to meet state specifications.

Interchangeability of LP Gases

LP gases, as used in this paper, designate varying combinations of propane and butanes and the unsaturated homologues. Because of the high specific gravity and high heating value of propane and butane, they cannot be mixed to any great extent with existing gas supplies and a carrier gas must be employed. There has been little attention paid to the possibilities of carrier gases.

Four important properties of the substitute gas should be considered in evaluating interchangeability: (1) Theoretical air requirements for combustion; (2) heating value; (3) specific gravity; and (4) ignition and burning characteristics.

Modern appliances possess considerable flexibility which permits reasonable changes without causing undue difficulty but the range of changes in these properties is nevertheless limited. Unless the air adjustment of appliance burners is corrected for a change, there may be too little air, causing incomplete combustion or too much air resulting in blowoff or flashback. The B.t.u. input per hour to appliances must be held constant within reasonable limits regardless of the B.t.u. of the gases.

The rate of gas flow varies inversely as the square root of its specific gravity and an increase in specific gravity will decrease the supply of gas to an appliance and vice versa. Also, as the specific gravity increases, so does its energy to inject primary air and primary air-gas ratios will rise when a heavier gas replaces a lighter gas.

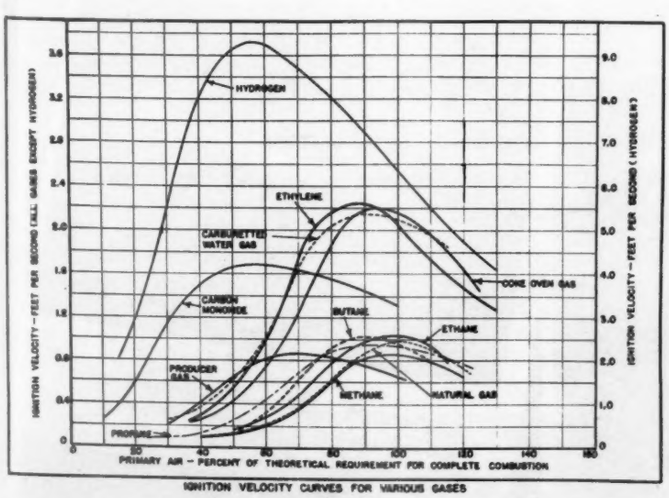
Most complicated of the four properties to consider are the ignition and burning characteristics. Propane and butane require considerably more primary air to eliminate yellow tips than does methane, but at 50 per cent primary air, or more, this ceases to be a factor for either case. If 20 per cent air were used, natural gas will probably burn satisfactorily while LP gases will cause yellow tips.

Fig. 1 shows the rates of flame propagation of natural gas and various other gases in terms of the per cent of primary air. These curves are helpful in predicting probable results of substitute gases. If a burner were adjusted on natural gas at 40 per cent primary air (flame speed approximately 0.1 ft. per second) and then propane-air replaced the natural gas, the primary air percentage might easily go to 50 per cent for the heavier gas and the flame speed would then be almost 0.3 ft. per second. This might be in the flashback zone.

Air has been the generally accepted carrier gas because of its cheapness and availability. The narrow explosive range permits a wide range of mixtures of air and LP gases to make any desired heating value but the specific gravity will be high. LP gas-air mixtures for replacing natural gas with little trouble require heating values substantially higher than the gases replaced. This factor has undoubtedly deterred many natural-gas companies from adopting LP gas-air mixtures for alternate peak-load fuel. Difficulties are even greater when this mixture replaces manufactured gas and no LP gas-air mixture is used for this purpose.

Uses of LP gas are rather limited insofar as the long-range peak-load problem is concerned. Utilization characteristics of the carrier gases are discussed rather than their economic factors. Carrier gases have been suggested which are believed to include the lowest in cost of any available materials. They are air, blast-furnace gas, blue gas, coke-oven gas, flue gases, hydrogen, oil gases, partially burned natural gas, producer gas, reformed or cracked natural gas and propane cracked with steam.

(Continued on Page 44)



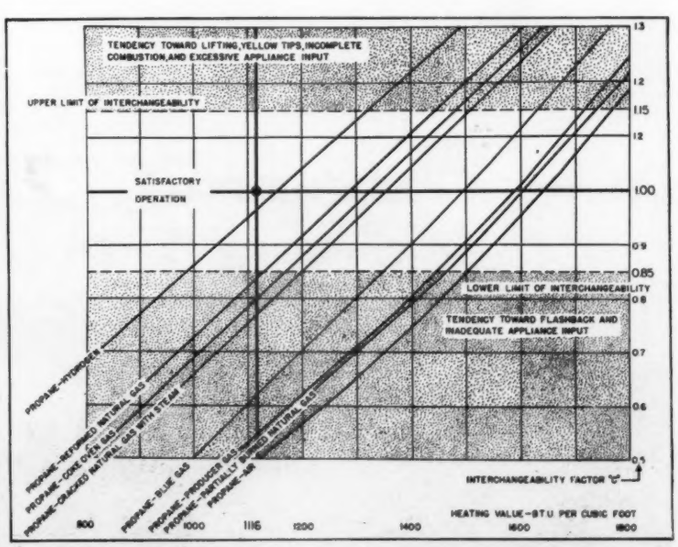


Fig. 1 (above)—Rate of flame propagation of natural gas and various other gases in terms of the per cent of primary air. Fig. 2 (right)—Chart prepared after a mathematical analysis to determine the interchangeability of various mixtures of propane and carrier gases with natural gas to fully supply peak-load demand

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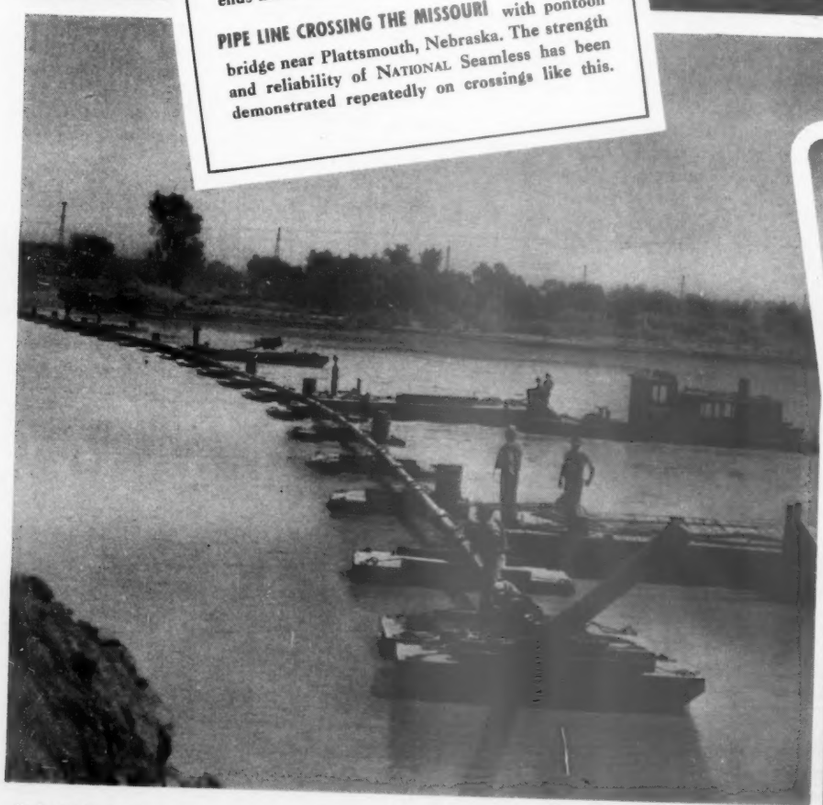

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To explore the possibilities of these gases it was decided to use the American Gas Association mixed gas research formula although it has limitations with respect to the LP gases. It was possible to compute the interchangeability, or "C," factor for a number of carrier gases with propane. The results of this mathematical exploration are plotted on Fig. 2 which gives a picture of the possibilities of the various gases.

The center of the chart is the intersection of the base natural gas (1,116 B.t.u.) and the "C" factor of one. The curves each show the variation in the "C" factor of mixtures of propane and the different carrier gases as their heating value varies.

In order for a gas to qualify as an ideal replacement for the natural gas, its "C" factor curve should also go through the center of the chart or near to it. None of the practicable gases in Table 1 would plot through the center but propane plus reformed natural or coke-oven gas come the nearest. Studies made by Benjamin Miller (Gas Advisers, Inc.) in conjunction with the M. W. Kellogg Co. indicate that propane cracked with steam also would product a gas with suitable properties although the methods did not seem economically feasible.

These gas mixtures should be capable of complete exchange for natural gas as well as a partial exchange. The chart indicates that the propane-reformed natural-gas mixture comes closest to providing a suitable replacement. The curve crosses $C = 1.0$ with the least excess in heating value (at about 1,290 B.t.u.) and a considerable part of the various possible mixtures lie within permissible limits. Propane-air, which is used in so many actual standby plants has the most distant of the curves plotted, $C = 1.0$ occurring at a rich gas level with a heating value of 1,640 B.t.u.

Less than optimum interchangeability may be permitted and horizontal lines at $C = 1.15$ and $C = 0.85$ have been drawn; these levels empirically selected, having been established by the A.G.A. mixed gas research.

The intersection of the curves with the vertical line (1,116 B.t.u.) shows the "C" factor for gas mixtures with a heating value of 1,116 B.t.u. just as the original natural gas. None of these intersections are at $C = 0.85$ or above. Propane-reformed natural gas just falls outside the pale. Partial interchange is possible up to the point where the combination would yield $C = 0.85$. Unfortunately, simple proportion does not furnish an exact method for determining how much substitute gas is permissible. It does approximately indicate what percentage can be used with the original gas. This, in effect, is stating that the "C" factor for the original gas is 1.0 and this permits a certain amount of reduction by adding gases with lower "C" factors.

Fig. 2 reveals that higher heating value mixtures have better "C" factors and, therefore, could be used to a greater extent for mixing. The chart also has a propane-hydrogen curve which lies almost exactly in the center of the chart. This indicates what is needed to mix with propane if it is to replace natural gas—a gas of low specific gravity, low heating value and relatively high flame speed.

Additional details of the properties of replacement gases beyond those shown in Chart 2 are given in the several parts of a table in the original paper, each one of which refers to mixtures of propane and a carrier gas.

Although the variation in the "C" factor appears to be the primary point to consider in connection with the various carrier gases, the changes in other properties may also be of interest. The percentage of natural gas required by the replacement gas may limit or enhance the usefulness of a substitute.

The possibility of controlling some of the difficulties of substitute gases by means of pressure changes was not overlooked but it seemed that local circumstances would play the deciding part in determining how far this could be utilized and the effect of changing pressures has not been included.

Present Status of LP Gas Use

The requirements for substitute gases intended to meet standby emergency service demands are somewhat different from those resulting from peak-load service. The consumer would, in an emergency, be tolerant of some departure from ideal conditions.

Gas companies using LP gas service for peak-load purposes must be sure that the customers will be practically unable to notice any difference. Any new gas conditions must not depart beyond certain margins or else serious complaints are likely to be encountered.

Reports of companies show that suitable mixtures of LP gases and air can and are being prepared for replacing any decided percentage up to 100 per cent of the regular natural-gas service. In general, the companies have found that the LP air-gas mixture must have a higher B.t.u. value than the natural gas, thus confining the use of the substitute gas to "emergency" requirements.

Gravities and heating values employed by the companies who are using LP gas-air mixtures to replace natural gas are shown in a table included with the paper. Tests made by several gas companies showed that an upper and lower limit of permissible B.t.u. values exists. Between these limits there would still be many appliances which would not operate satisfactorily on the substitute gas, but the degree of dissatisfaction varied widely among the several companies.

Experimental tests run by a number of the gas companies show that it is advisable to leave some natural gas in the mixture in order to eleminate customer complaints.

It is the intention of one company never to exceed 65 per cent of butane-air in the mixture sent out unless a higher percentage is unavoidable.

One company concludes that there is a big disparity in cost in favor of butane-air based on the actual cost data available to them from a nearby oil-gas plant. In the case of another company, the oil-gas plant was already in existence and is maintained ready for standby in the winter in addition to standby available from the butane-air service.

No discussion of numerous cases in which large industrial natural-gas customers own and operate standby LP gas-air plants has been included in this survey. Practically all of these plants are going to use an air-gas ratio which will require no burner readjustment, this being practical inasmuch as no state B.t.u. standards are involved.

Application of LP Gases to Enrich Water Gas as Natural-Gas Substitute

The method of utilizing LP gases suggested by the title of this section is practiced by a number of companies who are supplying various types of mixed, natural, and manufactured gas. In one community, 600-B.t.u. carbureted water gas is enriched to 800 B.t.u. with butane and then mixed with natural gas as required.

In another city, butane is mixed with blue gas and natural gas to make an 800-B.t.u. mixed gas with an increase in the specific gravity from 0.69 to 0.79. Butane can be used to enrich blue gas in the plant system allowing blue-gas machines to be fired up and operated to crack oil to a 650-B.t.u. oil-gas which can be cold-enriched by additional butane up to an 800-B.t.u. standard.

Both economic and technical reasons have limited the use of LP gases as enriching agents or as standby gases for straight manufactured-gas companies. In the case of manufactured gases, much narrower limits of usefulness exist because of the differences in heating value, chemical composition, and specific gravity of butane compared to the usual manufactured gas. In order to utilize butane successfully, it is necessary to mix it with blue gas, producer gas or air so as to balance these factors.

Quantities of substitute butane-gas mixtures which can be theoretically mixed with either coke-oven gas or carbureted water gas without requiring a readjustment of the consumer's appliances are included in a table in the paper. These substitute mixtures are designed to have the same heating value as the original gas.

The primary use of LP gases by manufactured-gas companies has been for enrichment purposes to bring the B.t.u. value of their gas up to the required standard.

TABLE 1—PROPERTIES OF GASES

Gas—	Gross heating value B.t.u.	Specific gravity Air=1.0	Cu. ft. of air required per cu. ft. of gas	Analysis of gas											Products of combustion — cu. ft. per cu. ft. of gas		
				CO_2	O_2	N_2	CO	H_2	CH_4	C_2H_6	C_2H_4	C_6H_6	C_3H_8	C_3H_6	C_4H_{10}	H_2O	CO_2	N_2
These gases were computed:																		
Natural gas	1,116	0.64	10.47	0.7	....	0.5	....	....	84.0	14.8	....	....	....	....	....	2.20	1.14	8.28
Propane	2,572	1.52	23.82	....	....	....	....	....	....	....	....	....	....	100.0	....	4.17	3.00	18.82
Hydrogen	325	0.070	2.382	....	....	....	....	100.0	....	....	....	....	....	....	....	1.00	....	1.882
Reformed natural gas	599	0.41	5.22	1.4	0.2	2.9	9.7	46.6	37.1	....	1.3	....	0.8	....	....	1.30	0.53	4.16
Coke-oven gas	574	0.44	4.99	2.2	0.8	8.1	6.3	46.5	32.1	....	3.5	0.5	....	....	....	1.25	0.51	4.02
Cracked natural gas with steam	330	0.32	2.46	1.1	....	1.2	23.8	72.0	1.9	....	....	....	....	....	....	0.758	0.268	1.952
Blue gas (coke)	287	0.57	2.10	5.4	0.7	8.3	37.0	47.3	1.3	....	....	....	....	....	....	0.53	0.44	1.74
Producer gas (bituminous)	163	0.86	1.23	4.5	0.6	50.9	27.0	14.0	3.0	....	....	....	....	....	....	0.23	0.35	1.48
Partially burned natural gas	78.5	0.91	0.62	5.8	....	74.0	8.7	9.6	1.9	....	....	....	....	....	....	0.134	0.164	1.228
Air	0	1.00	—1.00	....	21.0	79.0	....	....	....	....	....	....	....	....	....		(O_2 0.21)	0.79
These gases were not computed:																		
Butane	3,225	1.95	30.47	....	....	....	....	....	....	....	....	....	....	7.0	93.0	4.93	3.93	24.07
Refinery oil gas—liquid-phase cracking	1,650	1.00	....	....	0.2	0.6	1.2	6.1	4.4	72.5	....	....	....	....	....	....	....	....
Refinery oil gas—vapor-phase cracking	1,475	0.89	....	0.2	0.2	0.5	1.2	13.1	23.3	21.9	(Illuminants 39.6)				....	....	....	....
High B.t.u. oil gas	970	0.65	....	1.5	0.5	4.0	5.0	25.0	39.0	....	(Illuminants 25.0)				....	....	....	....
Oil gas	551	0.47	4.73	4.7	0.3	3.6	12.7	48.6	26.3	....	2.7	1.1	....	....	....	1.15	0.56	3.77
Reformed refinery oil gas	530	0.51		2.3	0.7	4.9	20.8	49.8	12.3	5.5	(Illuminants 3.7)							
Blast-furnace gas	92	1.02	0.68	11.5	....	60.0	27.5	1.0	....	....	....	....	....	....	....	0.02	0.39	1.14
Flue gas	0	0.96	0	11.8	0.1	88.2	0.0	....	....	....	....	....	....	....	....	....	....	....

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Shell Using Steam-Operated Pipe Tongs at California Rig

By T. P. SANDERS

BREAKING with conventional drilling practice, as it so often has in the past few years, Shell Oil Co., Inc., has replaced the cathead spinning line with a steam-operated McFadyen geared power tong at one of its Ten Section rigs. The drill-string power tong is an adaptation from the previously designed pneumatic McFadyen geared tubing tong. The chief reason for its development was to avoid the accident hazard presented by the spinning line and cathead. Secondary reasons were reduction of round-trip time, and uniform makeup for all joints of the drill string.

Making up kelly on drill string with power tongs. Roller-bearing drive bushing stays in place on the kelly at all times

It has been previously reported that the Ten Section rigs use tubing or casing in place of drill pipe. First experiments of this kind were with 4½-in. tubing, but now 5½-in. casing is being used. After the total depth has been reached, the bit, reamers, and drill collars are removed and the drill string is cemented in the well as casing. If regular drill pipe was being used, the power tong would offer less advantage because it would be necessary to employ the tongs operated by the jerk line to finally tighten the joints after the power tong had done its work.

Unlike the pneumatic tubing tong, the steam drill-string tong is only used while the pipe is being run into the hole as the pipe is unscrewed by spinning out with the rotary table when coming out of the hole. It now appears improbable that a portable power tong will even be suitable for breaking down drill pipe because of the high torque required for breakout.

In the power tong the self-engaging jaws are mounted within a large circular main gear which has an open throat to permit insertion over the pipe. This main gear is operated by two drive gears so placed that one will always be engaged while the other is opposite the throat or cutaway portion of the main gear. The two drive gears are operated by a fourth gear and this in turn is connected to the crankshaft of a four-cylinder radial engine of a type commonly used in mines to drive small pumps.

Built for compressed air, high-pressure gas, or any other expansive medium, the tong engine is operated by steam at the Shell rig. A regulator on the supply line reduces the steam pressure to a constant 120 lb. The tong is counterbalanced in the derrick like regular tongs, and a wire "backup" line is used to keep it stationary while it is applying torque.

Steam Pressure Constant

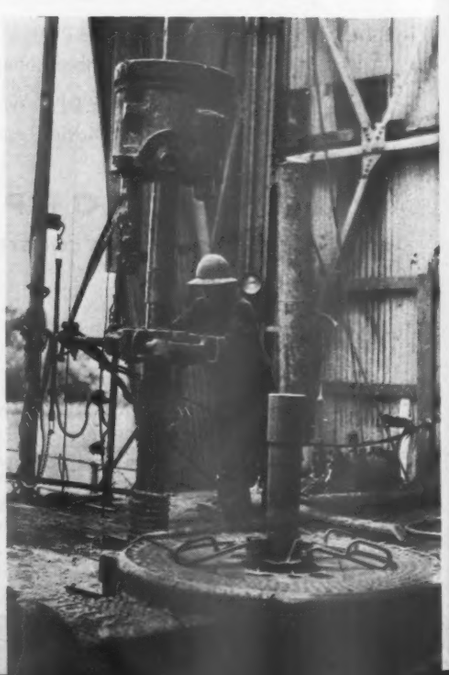
In operating the power tong the joint is first stabbed, and the tong is "slapped" on the pipe. The steam engine then is started, and the pipe is rotated at a rate of about 80 r.p.m. until the engine is stalled. Since the steam pressure is held constant, stalling always occurs at the same torque, and it follows that uniform makeup is obtained throughout the string. The tong is released by reversing the engine and rotating the main gear a fraction of a revolution so that the open throat will assume the proper position for removal from the pipe. It has been found possible to make up a joint in 14 seconds, including the time spent in engaging and disengaging the tong. Addition of a new joint is speeded up by Shell crews by making rathole connections with the power tongs being used for the makeup of the kelly on the joint in the rathole as well as the makeup of the joint on the drilling string.

The steam tong described above is the only one being used at present in drilling operations, but there are several geared tubing tongs in use in California, and one such machine was recently shipped to the Mid-Continent for use in the Oklahoma City field. In regard to mechanical operation, the tubing tong is identical to the drill-string tong, but it is powered by a smaller engine. Most models use a two-cylinder double-acting engine driven by high-pressure gas or compressed air. Satisfactory operation is obtained with a pressure of 100 lb.

The pneumatic tubing tong is used both for making up and breaking down the string. Having two gear ratios, the low speed provides sufficient torque for breaking out the joints and the high gear completes the spinning out.

Aside from its application in well-servicing work, the power tong probably will find its most useful application where long casing strings are to be run. Here time is at a premium because of the number of men and the quantity of equipment tied up, and also the spinning-line danger is ever present. The geared power tongs are being made in sizes large enough to make up 8⅝-in. casing. Larger sizes appear to be practical, but since the stresses involved cannot be calculated accurately, the machines must be built in progressively increasing sizes so that field experimentation will assure satisfactory service.

Left: New joint in position in auxiliary rathole ready to be added to string. Right: Second step in a rathole connection with the joint being turned to screw it on the kelly. Note that casing is being used for drill pipe



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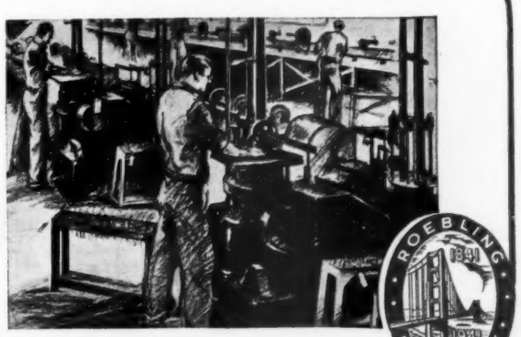

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Presented before the Petroleum Division meeting, Dallas, Tex., Oct. 16-18

Effectiveness of Gravel Screens

B. H. SAGE and W. N. LACEY (California Institute of Technology)

RESULTS of an extensive experimental program relating to the effectiveness of gravel screens have been correlated. Permeability is not a single-valued function of the average grain diameter but is related to the size, size distribution, and the shapes of the particles.

The effectiveness in increasing productivity by means of a gravel screen with a particular configuration increases as its permeability increases but at a decreasing rate. If the ratio of permeabilities is in the order of 25, there is little more to be gained by increasing the screen permeability. Gravel-screen effectiveness increases with diameter but with a decreasing rate.

Migration of sand particles through a coarser porous medium is influenced by particle size, size distribution, conditions of packing, size and size distribution of screening material, velocity of fluids flowing and their properties.

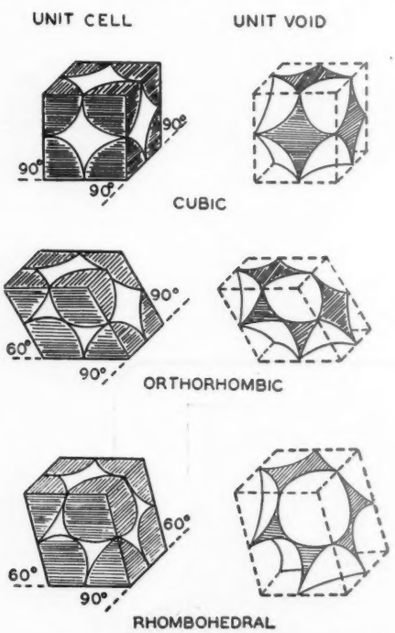


Fig. 1—Types of systematic packing

Intersitital spaces in a gravel screen and the resistance of the screen to particle migration are controlled to a great extent by the condition of the packing. The more probable cases of systematic packing are limited to three general types shown in Fig. 1. The minimum interstitial spaces encountered in passage through a unit cell of cubic packing are subquadilateral openings while in the orthorhombic packing the openings on only two of the sets of opposite sides are subquadrilateral and the opening of the opposite set of faces are subtriangular. Rhombohedral packing yields subquadrilateral openings on only one set of opposite faces and subtriangular openings on the other two sets.

From a consideration of the geometry of the subquadrilateral and subtriangular openings, the minimum number of particles required to form a bridge in the interstitial spaces of gravel has been ascertained approximately. The data presented indicate that the minimum number of particles required to form a bridge in a subquadrilateral opening is about eight times that required for a subtriangular opening involving the same size of gravel. The authors then develop mathematically the possibilities of a bridge forming and sand concentration in relation to the producing formation-gravel interface.

The relative thickness of a screen required to accomplish the same retention of an oil-field sand is shown as a function of the porosity of the screen. A change in porosity of the gravel screen from 30 to 40 per cent causes more than a threefold increase in the thickness of the screen necessary to accomplish the same results.

Experimental Results

Check of the probability considerations and the effect of the flow of fluids upon the migration of the sand through the gravel pack were made experimentally. Results led the authors to believe that the semilogarithmic sand-content distribution predicted on the basis of probability considerations is descriptive of actuality over a wide variety of conditions but that predictions based on geometry alone are insufficient to estimate the effectiveness of a gravel screen since the hydrodynamic conditions become of great importance in certain instances.

A series of measurements under radial flow conditions was made with arrangement for the removal of the sand after migration through the gravel screen. Results for a closely sized sand and three naturally occurring gravels indicate a gradual decrease of the sand concentration in the fluid leaving the section as the rate of flow is increased. This is followed by a rapid increase in concentration after a minimum value has been reached (Fig. 2.). It should be realized that although the concentration of sand leaving the section goes through a minimum as the rate of flow is increased, the amount of sand transported per unit of time steadily increases as the rate of flow is increased.

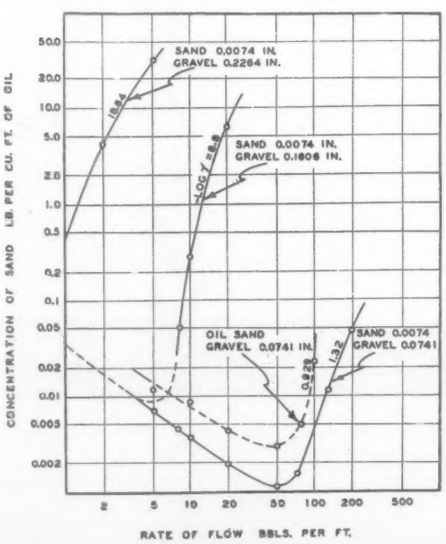


Fig. 2—Sand concentration in oil leaving gravel screen

The authors proceed to a correlation of the results of the experimentation with the mathematical prophecy and then apply the equations developed to a particular theoretical well. In the particular case, a well operated at 2,000 bbl. per day and having a subsurface pressure of 2,000 lb., a bore diameter of 16 in., and a liner of 6 in., it was found that a gravel diameter of 0.085 in. would be suitable. This would produce a pack having 68 rows of gravel between the sand face and the liner.

Sampling Gas-Condensate Wells

J. M. FLAITZ (Union Producing Co.), and A. S. PARES (Consulting Engineer)

AT reservoir conditions, the fluids produced from a condensate well exist in a homogeneous vaporous condition. The reduction of temperature and pressure as this gas enters and flows up the well results in condensation of some hydrocarbon material to form a liquid. The relative amount of liquid produced at any point is a function of the pressure and temperature there.

Subsurface samples can be obtained for analysis but generally in insufficient quantities to permit accurate determinations. Sampling at the separator is unsatisfactory as is the use of the separator by control of the pressures and temperatures for arriving at the phase relations.

The highest pressure and temperature available as a sampling point is the well head and this is the ideal point at which to sample the well stream and obtain aliquot parts of liquid and gas. A tip fastened to a piston and attached to a tube can be forced down the lubricator so the tip is in the christmas tree where a sample may be obtained from the undisturbed portion of the fluid flow. Identical velocities are maintained through the sampling tip and the tubing during the sampling period.

To sample a well it is necessary to have stabilized conditions of flow throughout the system. In general, the higher the rate of flow, the more homogeneous the stream becomes. Wells producing fluids rich in condensable material must be flowed at a higher rate than "lean" wells and high-pressure wells must be flowed at a greater rate than low-pressure wells. A practical rate of flow for stabilized conditions is 15 to 20 ft. per second.

The setup necessary to make tests on the wells consists of equipment for taking a complete set of observations and samples from a 30-in. by 11-ft. separator and equipment to take observations and samples simultaneously from the portable testing apparatus. The results obtained from the standard separator and by the portable tester are compared in tables given in the paper. Checking the accuracy of the sampling by obtaining data and computing the yield and comparing this with the actual plant operation has shown a maximum deviation of 7 per cent and an average deviation of 1 per cent from the plant yield.

Portable testing equipment is mounted in a

trailer and includes a separator, a calibrated liquid accumulator, heat exchangers, and cooling equipment; a constant temperature is maintained on the separator while making a test. A back-pressure regulator and a positive-displacement meter are included. Connections are kept at a minimum and heat is applied to valves and lines where freezing from the formation of hydrates might take place. A hand pump, air compressor, and means for securing samples are provided.

The portable testing apparatus is used to determine the content of gas produced from wells and run to a gasoline plant without being separated at the well, for studying the economics of a recycling operation and for estimating recoverable condensate reserves.

Natural-Gas Hydrates

DON B. CARSON (Assistant Professor, Chemical Engineering), and DONALD L. KATZ (Graduate Student, University of Michigan)

NATURAL-GAS hydrates are white crystalline compounds of water and gas, which, under pressure, exist at temperatures considerably above the freezing point of water. Because of the relatively high temperatures at which the hydrates exist, they become a nuisance in high-pressure gas operations where water is present.

Up to the present time no method has been available for predicting the temperature at given pressures or the pressure at given temperatures at which natural gases will form hydrates if saturated with water. This paper presents data on the methane-propane water, methane-pentane water, and methane-hexane water systems in four phases, one of which is the hydrate.

The apparatus used consists mainly of a glass-windowed cell which is capable of rotation for agitation of the contents. The temperature of the cell is indicated by the glass thermometer in the constant-temperature water bath surrounding it. The pressures were measured by a calibrated Bourdon tube gage.

The data on methane-pentane water and methane-*n*-hexane water when plotted fall along the curve for pure methane. This indicates that paraffin hydrocarbons boiling above *n*-butane may not form hydrates.

The substantiation that natural-gas hydrates are solid solutions and the hydrate-composition data given justify an elaboration of the vapor-solid equilibrium constant concept previously proposed by Carson and Katz.

Vapor-solid equilibrium constants are presented that permit the approximation of the conditions for hydrate formation, from the composition of a gas.

A Comparison of Marsh-Funnel and Stormer Viscosities of Drilling Muds

J. E. OWEN (Geophysical Research Corp.)

EXPERIMENTS on 26 drilling muds were carried out in an effort to establish a correlation between the apparent viscosity values for these muds as obtained with the Marsh funnel and Stormer viscosimeters. This required a calibration of both instruments in which the density of the calibrating liquids was taken into account. Corresponding to the Marsh funnel viscosity values that were obtained at 1,500 cc. in, 1 qt. out, equivalent Stormer viscosity values were obtained at a Stormer cylinder test speed of approximately 1,100 r.p.m.

Further, a linear relation between the logarithms of the Stormer cylinder test speed and the resulting apparent viscosity was found to exist for the muds tested for 200 to 1,000 r.p.m. The significance of the slope of this linear relationship is discussed as it applies to the field use of drilling muds. Author concludes that Marsh funnel viscosity measurements are expressible in absolute units that may be correlated with Stormer viscosity measurements provided these are made in the manner described in the paper.

A Chart to Provide Approximate Correction for Temperature and Deviation From Boyle's Law

ALBERT D. BROKAW (Consulting Geologist, New York)

A RAPID and simple method of correcting temperature and compressibility deviations from Boyle's law under high temperatures and pressures is presented. The chart is based on interpolating for the desired values in experimental data on the compressibility of methane after adjusting their results from 0° C. to 60° F. and combining the correction factors into a single multiplier, which applied to reservoir temperature and pressure will give the volume at 1 atmosphere and 60° F.

The chart as presented applies only to methane and will give low values for mixed hydrocarbons. It can be made suitable for other gases by shifting the coordinates, reducing the temperature and pressures the proper amounts and reading as before.

Production Under Effective Water Drive as a Standard For Conservation Practice

E. De GOLYER (Consulting Engineer, Dallas, Tex.)

WATER drive exists, it is generally believed, to a degree great enough to be made effective in more than 80 per cent of the fields of the United States and should be utilized to keep the gas in solution and thereby increase production. The bottom-hole pressure should be maintained and the gas-oil ratio prevented from increasing. Some decline from the original bottom-hole pressure and the production of some gas are essential. A pressure gradient from the reservoir to the well is necessary and at least as much gas must be produced as that in solution in a barrel of oil. The optimum pressure should be maintained once it is established.

For effective water drive the natural influx of water must be at a rate as great as or greater than the withdrawal of the oil-gas solution and the water from the reservoir.

Advantages of operating under an effective water drive are fourfold: (1) a greater amount of the oil originally in place will be recovered; (2) the flowing life of wells will be prolonged and lifting costs reduced; (3) fewer wells will be required to obtain the production, and (4) the bulk of proration can be based on scientific principles rather than on arbitrary, economic, or political grounds.

An engineer estimates that about twice as much oil can be produced from a water-drive field as from a nonwater-drive pool. Effectiveness of water drive depends on the rate of production from the entire pool rather than upon the rate per well. Disadvantages are a delayed return on the investment and the necessity of grouping small tracts.

Each new pool should be operated in an attempt to allow water drive to be effective. Exceptions should be granted only after it is definitely proved that water drive is of too low a grade to be made economically effective.

Dimensional Model Studies of Oil-Field Behavior

M. C. LEVERETT, W. B. LEWIS, and M. E. TRUE (Humble Oil & Refining Co., Houston, Tex.)

THE use of scale models for the solution of dynamic problems requires that the ratios of the fundamental dimensions (mass, length, and time) of the model and prototype must be constant. Physical variables bearing on the problem must be selected and scaled. For the mixture-flow problem these may be obtained from the fundamental differential equation governing it and the boundary conditions. This relation is:

$$\frac{\delta}{\delta x}(q_t f_x) + \frac{\delta}{\delta y}(q_t f_y) + \frac{\delta}{\delta z}(q_t f_z) = \phi\frac{\delta S}{\delta \Theta} \quad (1)$$

Where:

$$f_n = \frac{1 + \dfrac{K_o}{q_t \mu_o}\left(\dfrac{\delta P_c}{\delta u} - g\Delta\rho\cos\alpha\right)}{1 + \dfrac{K_o \mu_w}{K_w \mu_o}} \quad (2)$$

for the flow of oil and water through sands. Meaning of the symbols are found in the table Physical variables must be properly scaled between the model and the prototype. Boundary conditions are the linear dimensions of the sand body and the initial saturation and pressure gradient distribution.

In Equation 2 only two ratios of variables may be arbitrarily fixed as only three dimensions are evolved and g, the gravitational constant, is a pertinent variable. The ratio of linear measurement must also be chosen as the purpose is to reduce the problem to a suitable size. This leaves $\Delta\rho$, P_c, K_o/μ_o, and K_w/μ_w, only one of which may be arbitrarily fixed. This must be $\Delta\rho$ because of the limited number of suitable pairs of liquids. Sands and liquids must be chosen so that the ratios P_c and the fluid conductivities K_o/μ_o and K_w/μ_w have the correct values. Experimental work has shown correlations between the relative permeabilities of clean unconsolidated sands and the fluid saturations and between the capillary pressure, fluid saturation, $\sqrt{\phi/k}$, and the interfacial tension of two fluids.

Interfacial tension of the liquids, sand permeability, or viscosities of the fluids may be chosen and the others fixed. A maximum limit of sand-grain size of about 20 mesh is found to exist. This practically limits the model reduction to 1/20. Models containing hydrateable materials cannot be used as their effect on permeability and capillary pressure is not known.

Two models using glycerin and a heavy lubricating oil and sand to represent radial flow in the region for 16 ft. around a well and linear flow at a point far from the well were built and operated.

The 22-in. diameter radial model contained uniform sand and was constructed so a constant total rate of fluid flow could be maintained. Approximate saturations could be determined by electrical probes. A ⅜-in. slotted tube represented the well and could be made to represent any type of well completion in relation to the oil-"water" interface. A photoelectric relay operated a pump to supply a steady radial flow and a constant fluid interface was maintained in the reservoir. Different rates, fluid ratios and liner settings were used to study the effect of "water" coning about producing wells. Results are given in figures in the paper.

The linear model contained sand of two sizes and was used to study the effect of sand texture, viscosity, surface tension, rate of displacement, etc., on oil recovery from nonhomogeneous sands by water flooding. Oil was displaced from the sand with identical initial saturation conditions

and varying amounts of glycerin injection and the resulting fluid saturations measured at different points in the sand. Recovery efficiencies were calculated from these values. Results are shown in figures in the paper.

It is important to realize that not only physical but also dynamic variables must be scaled. The grain size is larger in the model than in the prototype and this means that the fluid viscosities must be high to make the frictional effects comparable. The use of unscaled models makes some functions act in wrong proportions in the model. This has been the case with boundary effects in many experiments on mixture flow.

NOMENCLATURE AND DIMENSIONS OF VARIABLES

Symbol	Meaning	Dimensional description
* B_o	Effective fluid conductivity to oil; $B_o = K_o/\mu_o$	l^3t/m
* B_w	Effective fluid conductivity to water; $B_w = K_w/\mu_w$	l^3t/m
* f	Fraction of flowing stream comprising water	None
* g	Gravitational constant	l/t^2
* $j(S)$	Capillary pressure function	None
K_o	Effective permeability to oil	l^2
K_w	Effective permeability to water	l^2
*$k_o(S)$	Relative permeability to oil; $k_o(S) = K_o/K$	None
*$k_w(S)$	Relative permeability to water; $k_w(S) = K_w/K$	None
K	Specific permeability of sand	l^2
* P_c	Capillary pressure; P_c = press. in oil — press. in water	m/lt^2
* ΔP	Pressure differential	m/lt^2
* Q_t	Total production rate (example: bbl./day)	l^3t
* q_t	Linear flow rate (example: bbl./ sq. ft. of cross-section/ day)	l/t
* S	Fractional water saturation	None
* u	Distance in any direction, "u"	l
*x, y, z	Usual rectangular space coordinates; used to state size and shape of system	l
* α	Angle of inclination of direction u with horizontal	None
γ	Interfacial tension between liquids	m/t^2
* Θ	Time	t
μ_o	Viscosity of oil phase	m/lt
μ_w	Viscosity of water phase	m/lt
* $\Delta\rho$	Difference in densities of oil and water	m/l^3
* ϕ	Fractional porosity	None

*Pertinent properties of system. Must be scaled.

Electric Resistivity Log

G. E. ARCHIE (Shell Oil Co., Inc., Houston, Tex.)

THIS is an attempt to put electrical well logging on a quantitative basis, and shows that a relationship of resistivities exists as follows: $R_o = F \times R_w$, where R_o = resistivity of sand filled with brine, R_w = resistivity of brine, and F = formation resistance factor. Type curves are also given for F, when permeability and porosity of particular sand is known. This is a logarithmic value. It is also shown that there is a relationship of resistivity to water content where content is above 15 per cent. Equation is $R = b\,S^{-n}$, where R is resistivity, b is a constant equal to R_o above, S is per cent water saturation, n = component which for Gulf Coast sands is about 2. By use of above equations, and correcting for well bore and strata thickness, the resistivities can be calculated for various percentages of water. These check fairly well with field data. Under favorable conditions it should be possible to determine per cent connate water, per cent porosity, and salinity of water, within reasonable limits.

●

Slim-Hole Drilling Develops Changes in Technique

(Continued from Page 33)

The other type of joint has an ordinary pin on each end of the pipe, the coupling member for the joints being a double-box sub. The box is, of course, oversize and takes most of the wear. As it has a thinner body, it cannot be rebuilt without danger of warping and consequently it is discarded when worn down to 4¾ in. or less. However, the initial cost of the sub is less.

In handling both types of pipe the wear is distributed as evenly as possible by turning the joints around on each well. This requires only that the double box or double pin be broken off and put on the opposite end. It does look odd to see a kelly equipped with a box as its lowest connection instead of the usual pin.

Through the use of such pipe the life of a string has been increased and has been around 150,000 ft. in some cases. Naturally the formations pentrated have a great influence on the service obtained and the frequency with which the double pins or boxes must be rebuilt or replaced. In the Cromwell area the normal life of the subs is from 15,000 to 20,000 ft. In case the portion of the tool joint on the pipe becomes worn, it can be built up by welding, but this is done only after examination of the pipe body to make sure it will give considerably more wear.

Considerable experimentation has been done with drill-collar arrangements and at the present time three 30-ft. drill collars weighing from 1,200 to 1,400 lb. each are being used. These have a bore of 2¼ in. and an outside diameter of 5 in. and are connected by a double-pin sub. The aim, of course, is to get as much weight as possible at the bottom of the string, and it has been found that two drill collars do not provide enough weight. The use of four drill collars was tried for a time, but it was found that the trouble with pulled threads and broken joints was increased substantially. Some trouble is experienced with the joints when three drill collars are used, but not enough to offset the advantage gained through the use of the additional weight. It has been observed that practically no trouble occurs while using only two drill collars.

Weight used on the drill stem is comparable with that run in larger holes, being from 10 to 12 points (a point on the weight indicator used is approximately 1,000 lb.) When it is considered that the area contacted by the 6¾-in. bit is only a little more than half that of an 8¾-in. bit, this compares with the 10 to 12 tons used normally in this area.

Fishing

It is probably in fishing, and the thinking concerning this part of the operation, that the severest revision has been made. The limitation imposed by the small clearance in the hole has caused a redesign of fishing tools and a reduction in the body thickness of overshots and other similar tools. With 5-in. drill collars and tool joints in the hole, only an inch remains for the body and slips in the overshot. An overshot with 5⅞-in. o.d. can be obtained which will catch 5-in. tool joints; the body of this overshot has considerably more strength than 3½-in. drill pipe.

The ordinary twistoff presents little difficulty as it can be picked off bottom easily with the overshot. In the small diameter holes it is really easier to get over a fish than it is in a larger hole. The small hole also permits the insertion of a tapered tap in the fish or the use of a die collar or nipple. Another matter which is simplified is the screwing of a companion coupling into or onto a tool-joint connection in the hole. This is particularly useful when backing off as in case the pipe unscrews at the wrong place, the upper portion of the string can be lowered and the string reassembled; another attempt to back off can then be made by taking a strain on the pipe and rotating to the left.

Washing over a stuck string of pipe or a fish around which it is impossible to get circulation is very difficult in a slim hole, principally due to the danger of sticking the washover string. Washing over has been done successfully but it is generally both expensive and dangerous. Special insert pipe must be used in the wash string to allow passage over the 5-in. o.d. tool joints.

The freeing of stuck pipe often runs into considerable time. Fishing operations are always more expensive than normal drilling due to the high cost of rental tools, delays in finding the right tool and discussions as to the best procedure. For this reason a very loose limit of 72 hours for fishing, above 4,500 ft., is imposed. This leads to trying more desperate measures early in the fishing job instead of playing safe. In case the fish cannot be pulled the fishing string can be shot or backed off and the rig skidded ahead.

This means that the old saying, "never lost a hole," is obsolete in slim-hole drilling as a bad fishing job can easily cost more than the drilling of a new hole. A recent example of this was the moving ahead of a slim-hole rig after trying to free drill pipe stuck at 2,800 ft. Circulation could not be established and it was evident that a nasty job was developing. A strain was taken on the pipe and the string was backed off, leaving seven joints and two drill collars in the hole. The unit was then moved ahead 25 ft. and a new hole started in less than 8 hours.

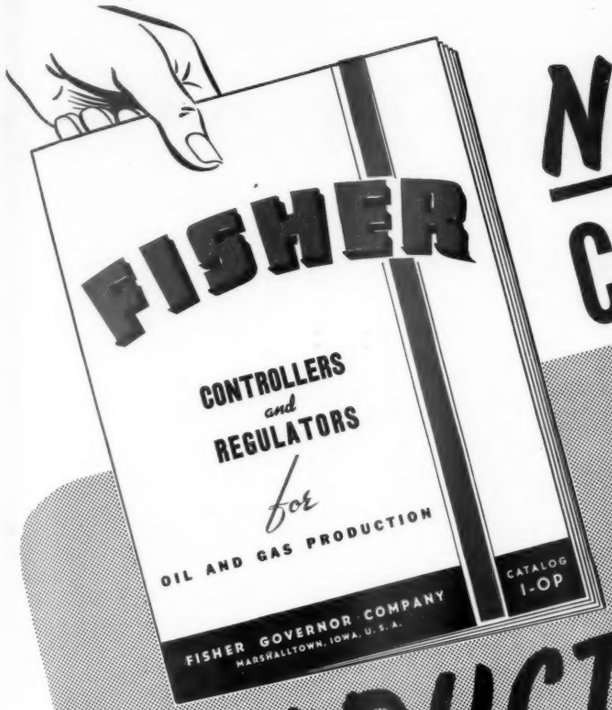
In contrast to this is the 9 days' fishing time spent by a contractor to free a string of 3½-in. pipe stuck in a 7⅞-in. hole. In this case there was more clearance for washing over and a special string of pipe was not needed. The contractor had also drilled to 3,800 ft. and consequently had more money invested in the hole to justify the longer fishing job.

Sticking of the pipe is one of the main dangers in slim-hole drilling but as long as circulation is maintained it is generally possible to get loose by spotting oil. In some cases acid has been used when the bit was stuck in a lime formation. Driving of the 3½-in. pipe is rarely attempted, principally because most of the sticking occurs while the bit is on, or immediately off, bottom. As pointed out previously, the loosely established time limit set on fishing job prompts the drillers to take desperate measures early in the game to free the pipe.

Pipe becomes stuck through a number of causes, the principal ones being the plugging of the bit, collection of cuttings around the bit and drill collars and the building up of a heavy filter cake on the walls of the hole. Velocity of the mud stream where two 5 by 8-in. pumps are used with 3½-in. drill pipe in a 6¾-in. hole is greater than the velocity produced by an 18-in. pump with 7-in. liners operating at 32 s.p.m. and used with 4½-in. pipe in an 8¾-in. hole. With properly conditioned mud the dangers of getting stuck are no greater in small-diameter hole than they are in a large one.

The rest of the slim-hole operation is similar to big-hole drilling. Drill-stem tests are resorted to frequently and are carried out as easily and with as much certainty as they are on the larger holes. The coring program varies with the locality but cores are frequently taken on the slim-hole rigs and over a period of time the recovery has averaged around 80 per cent. Electric logging is used extensively to determine the pay horizons in the small holes and the operation is conducted without any difficulty. The use of mud analysis as a means of logging in wildcats and in lime country produces a more immediate reading as the smaller holes insure quicker return of the drilling fluid.

In short, slim-hole drilling presents some changes in operation, many advantages and practically no disadvantages.



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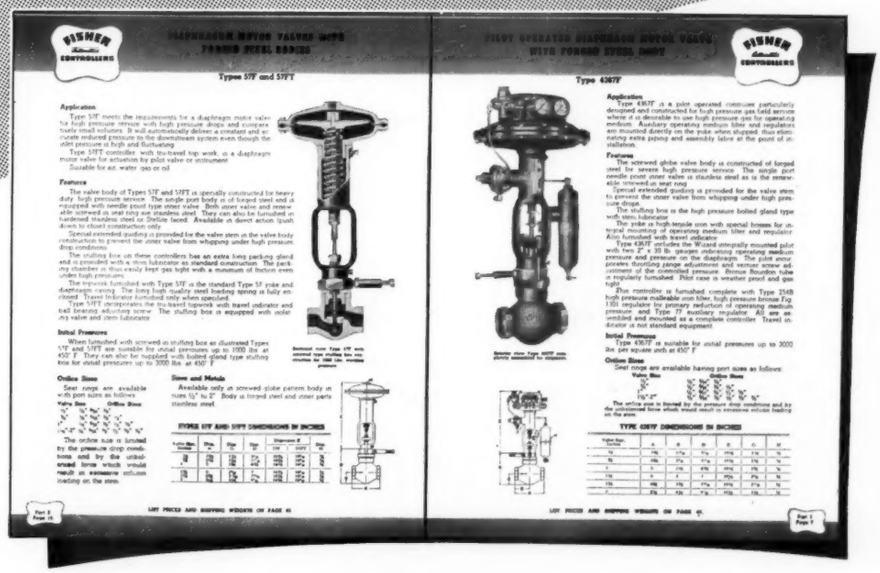

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Filtration Formation Cementing of Low Gas-Oil Ratio Wells

By J. I. LAUDERMILK
Instructor, Petroleum Engineering, University of Texas

J. I. Laudermilk is a native Oklahoman. He graduated from the University of Oklahoma, receiving his degrees of Bachelor of Arts and Bachelor of Science in general engineering. The professional degree of Petroleum Engineer, was awarded by the university in June 1941. He was employed by Gulf Oil Corp. as petroleum engineer prior to his becoming a member of the faculty of the University of Texas. He has had extensive experience in oil fields of the Mid-Continent area. He is a member of numerous honorary, scientific, and professional organizations, and has written various technical articles relating to the petroleum industry.

INTRUSION of bottom-hole water into oil wells and the resulting high cost of oil production has led to many methods of attempting to exclude this water or at least retard its rate of influx. Plugs of wood, lead wool, cement and other materials have been used for this purpose for many years. More recently chemicals have been used to plug portions of the producing formation itself, thus tending to seal off the water-bearing section or to reduce its permeability to such an extent as to lead to a reduction in the rate of water production. Cement has also been used in a similar manner, both in unconsolidated sands and in limestone formations. Results in many cases have been extremely satisfactory and indicate that formation cementing for water shutoff has great possibilities for the future.

The problems encountered in formation cementing resolve themselves largely into two major subdivisions: subsurface operations, and surface control. Stated less technically, these two phases are: "What results are desired?" and "What means are available to secure the desired results?" This article is restricted to the formation cementing, by filtration methods, of low gas-oil-ratio wells, i.e., pumping wells producing negligible amounts of gas. Obviously many of the fundamental principles involved will apply to oil wells not falling in this category.

Subsurface Operations

To understand the subsurface operations involved in filtration formation cementing of low gas-oil-ratio wells for water shutoff one must clearly understand the fundamental principles involved and the desired results sought. The problems encountered are quite different from those involved in the cementing of a casing string, or in formation-cementing methods which use a sufficiently great pressure to break down the formational resistance and force a heavy slurry into the producing reservoir rock.

The processes involved in filtration formation cementing are quite similar to the functional performance of the old-type charcoal-sand-and-gravel filter used in the purification of water, although naturally in reverse operation. The cement should be injected into the well as an extremely thin slurry, thus permitting it to filter through the more permeable regions of the producing formation and gradually to be strained out or deposited along the paths of the flow channels, thus reducing the tendency of the fluid in the reservoir to travel into the well bore along these particular channels. Let this process be continued to its logical conclusion by the injection of a sufficient amount of cement slurry and the more permeable parts of the formation (normally the water-producing zones) will become filled with filtered-out cement particles and clogged in a manner analogous to the clogging of the water filter mentioned above. In filtering out through the various minute channels of flow throughout the producing formation the cement will plug these channels very effectively and cause the permeability of the portion involved to be greatly reduced. It may be open to question whether or not the cement will actually set in the flow channels as in the case of cementing casing, although this does appear to happen to some degree. However, appreciable benefits will be derived from the plugging of the formation by inverse filtration where actual cementation does not occur. Both processes of filtration and cementation are probably present in all cases and the predominance of the importance of one occurrence over the other may well depend to a marked degree upon the sizes of the channels of flow available for induction of the cement-laden fluid into the reservoir.

It must be emphasized that each well and producing formation constitute an individual problem and should be treated accordingly. Despite this, certain general facts will be of great assistance in beginning work of this nature. In general, a slurry of one sack of cement per 10 bbl. of water will satisfactorily infiltrate into an ordinary permeable formation, while a slurry of one sack per barrel of water will result in deposition of cement in the bottom of the well bore. These figures, based on experience, are applicable to general conditions, but may deviate considerably from those encountered in specific instances. Experience has also indicated that it is advisable to begin the injection of the cement by using a very thin slurry and gradually increasing the weight of the slurry by reducing the water-cement ratio until the desired plugging effects have been obtained. Also it is advisable to limit the amount of cement injected at any one time, and, if necessary, repeat the formation cementing during subsequent periods of time should well tests indicate the desirability of so doing. It is seldom advisable to inject more than 10 sacks of cement during one continuous operation, and smaller amounts should be used until the engineer becomes familiar with the subsurface conditions likely to be encountered in the given area.

The total amount of cement which may be injected into a well by filtration formation cementing will vary greatly with the different producing formations encountered in various oil fields, but will often be of such magnitude as to astonish one beginning in this type of work. The author once assisted in the formational cementing of an unconsolidated sand using this filtration method, in which case more than 1½ tons of cement were injected into the formation without deposition of any cement in the bottom of the well bore.

It is, of course, possible to place the old-type bottom-hole plug of cement in the well bore to supplement the effects of filtration formation cementing if such plugging back is unobjectionable.

Production Equipment Preparations

Before the necessary surface-control equipment hookup can be made and filtration cementing of the formation begun certain preliminary preparations must be made regarding the producing equipment of the oil well.

The sucker-rod string and pump must be removed to permit use of the tubing for transmission of the cement slurry from the surface to the formation.

If the mud anchor is closed at the lower end it is desirable to replace it with one having the lower end open. This will permit flow of the slurry directly from the tubing string without possible settling out of the cement due to abrupt change in direction of flow as in the case of a closed-end perforated mud anchor. This opening will also permit use of mechanical measuring devices should it be desirable to check for possible deposition of cement in the bottom of the well bore.

The tubing should be "spotted" so that the lower end of the mud anchor is adjacent to the part of the formation where the maximum cementation effect is desired.

Surface Control of Operations

One of the greatest advantages of filtration formation cementing is the simplicity of surface control of operations. It is not necessary to use expensive or complicated devices since the use of commonly used instruments will afford a high degree of accuracy of control. A simple hookup using only items of equipment available to all petroleum engineers is shown in Fig. 1. This surface-equipment hookup, while very elementary, will give satisfactory control in the greater majority of cases of filtration formation cementing.

Briefly, this equipment consists of the following essentials:

Water line.—The water line is needed to supply the injection water. A 2-in. line, tied into the lease water system or to a circulating tank will generally give satisfactory service. The capacity of the water line must be greater than the rate of flow of fluid into the reservoir rock during the cementing operations.

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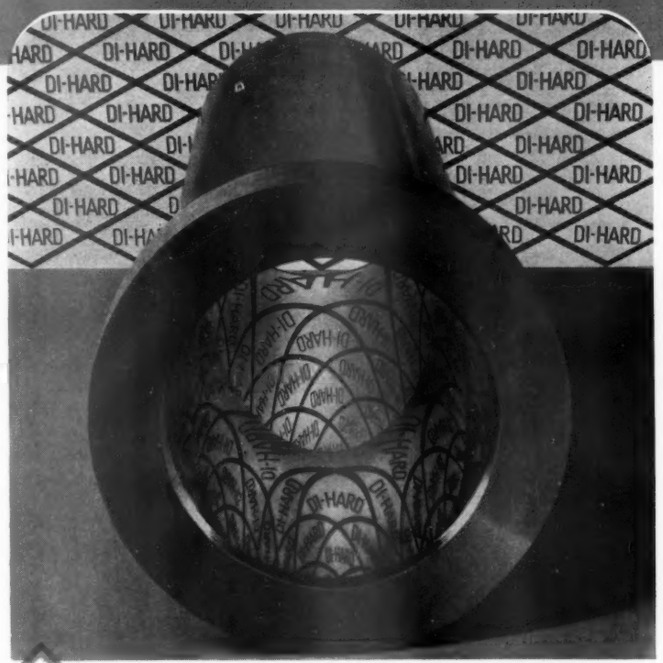

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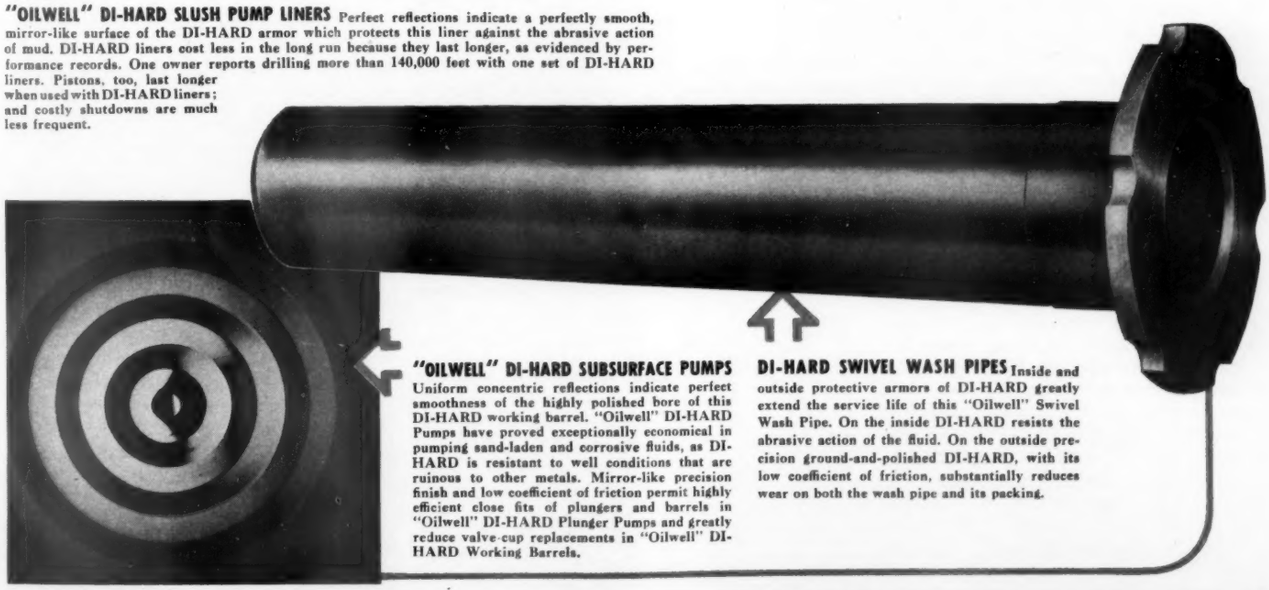

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Water meter.—A simple water meter connected into the water-injection line will enable the engineer to determine the water-cement ratio at any time during the injection of the cement slurry, thus permitting him to vary this ratio at will to meet individual conditions as they may arise. This meter should be placed near the tubing head so that it can be readily read by the person doing the cement injecting.

Injection-control gates.—At least two gates must be included in the surface control equipment for filtration formation cementing. These two gates consist of a water-injection-control and a cement-injection-control gate.

The water-injection-control gate should be placed near the tubing head where it can be manipulated without need of excessive moving around for this purpose. Preferably it should be placed between the tubing head and the water meter.

The cement-injection-control gate should be installed at the top of the cement-injection nipple. It is very desirable for this gate to be placed as far as convenient above the point of injection of the water into the tubing string (i.e., use maximum convenient length of cement-injection nipple) so as to minimize the tendency for the cement to become wetted by the spray before and during passage through this gate, as such dampening will tend to accentuate greatly the clogging of the control gate by the cement.

In addition to furnishing positive control of the cement slurry these gates will also aid in preventing air from entering the tubing string through the surface control equipment should temporary interruption of cementing operations occur. Exclusion of air is very important if satisfactory results are to be obtained. Extraneous air entrained in the slurry stream will be released when the fluid leaves the tubing string and, upon returning to the surface through the annular space, will cause fluctuations in the manometer readings. These fluctuations will indicate faulty surface operations instead of the subsurface conditions which the engineer must know.

Cement hopper.—A simple cement hopper which will give satisfactory results can be made in any machine shop. The hopper may resemble a large funnel with the lower part consisting of a short, threaded nipple welded to the conical upper part. The nipple should be threaded to screw into the cement-injection-control gate so that the hopper will be attached rigidly to the other parts of the surface control equipment. It is not necessary for this hopper to be of a very large size. The use of small amounts of cement (approximately one-third to one-half sack) will facilitate cleaning out the cement-injection control gate should it become clogged.

No mixing device is required as the cement and water will become thoroughly mixed during the period of transit down the tubing string. The jet-action effect of the injection of the water below the cement-injection control gate will tend to create a vacuum which will assist passage of the cement through the gate (thus reducing tendency to clog) and aid in the initial mixing by causing turbulence in the tubing string.

Orifice well tester and manometer.—These instruments are the "indicating devices" which will show an experienced engineer what is happening below the surface of the well.

The orifice well tester should be connected into the casing head; an operation which can be done easily by use of a nipple and tee to attach the well tester to one of the openings of the casing head. The manometer is then attached to the orifice well tester.

Practically any desired degree of sensitivity necessary for field work can be obtained by selection of a suitable opening in the orifice plate, and the measuring fluid to be used.

The above described surface control equipment, while quite simple in nature and utilizing only the commonest types of oil-field equipment, will, if properly used, give definite control of operations and accurate indications of subsurface occurrences. For purposes of clarification let us carry through a complete filtration formation cementing project, assuming a surface equipment hookup as indicated.

Water is injected into the well through the tubing to determine the rate at which the formation will take the fluid. The initial rate of injection is increased until the manometer at the casing head indicates a definite pressure, thus showing that the static fluid level in the annular space is rising (i.e., rate of injection is greater than the rate at which the fluid is entering the reservoir). The rate of injection is now reduced slowly, and the action of the manometer carefully watched. If a pressure continues to be indicated the injection rate is still too great, while the presence of a vacuum shows that the elevated head of well fluid is falling; or, stated otherwise, the reservoir is taking fluid at a higher rate than water is being injected. Static conditions are reached when neither pressure nor vacuum is recorded by the manometer. The injection rate corresponding to this condition is the rate at which the formation will take fluid before beginning filtration cementing of the formation. When this rate of water injection is determined the injection of the cement slurry can be begun.

The cement to be injected should be screened to remove any possible lumps that may be present as only the fine particles can be used in filtration formation cementing. The screened cement is placed in the hopper and the amount allowed to pass through the cement-injection control gate is regulated to give the desired weight of slurry.

It is desirable to start filtration formation cementing using a very thin slurry and to gradually decrease the water-cement ratio as operations progress. Use of too heavy a slurry initially will cause premature clogging of the formation in the immediate vicinity of the well bore and prevent injection of the slurry into the reservoir rock. This will cause deposition of cement in the bottom of the well and will give a water-shutoff effect comparable to that obtained by using a bottom-hole plug of cement.

Plugging effects on the formation are observed by watching the performance of the manometer and changing the rate of injection of the slurry so as to keep static conditions in the well bore. (Here it is well to note that the presence of entrained air in the fluid passing down the tubing string—i.e., admission of air through surface control equipment—will cause the manometer to record a high pressure, thus indicating an appreciable plugging of the formation when such may not be the true subsurface condition in the least.)

Having completed the injection of the amount of cement slurry desired the tubing is raised a considerable distance above the point of location during cementing operations, and is thoroughly flushed with water to cleanse it of any cement particles which may tend to remain in the tubing string. This flushing process will also place an added hydrostatic head upon the cement slurry previously injected into the formation and tend to prevent backwashing into the well bore.

The well should now be closed in for several hours to permit completion of the cement reaction in the formation. Production tests should be conducted upon the completion of this shut-in time to determine the results which have been obtained by the formation cementing.

Conclusions

Results obtained in various oil fields by this method of formation cementing have been quite satisfactory in many cases, both in unconsolidated sands and in limestone formations. Instances have been reported in which water shutoff exceeding 95 per cent of the prior rate of production have been secured in the siliceous limestone of western Kansas, and more than 85 per cent in unconsolidated sands in Oklahoma, with comparable results in other regions.

While filtration formation cementing for water shutoff in low gas-oil-ratio wells cannot be considered a universal solution for water-intrusion problems, this method of reconditioning does hold great possibilities and will undoubtedly be used to a considerable extent in the future. In this work, as in all others in the petroleum industry, proficiency will be gained with experience, and once the general characteristics of a region are known, very satisfactory results, with a minimum of expense, may be reasonably anticipated.

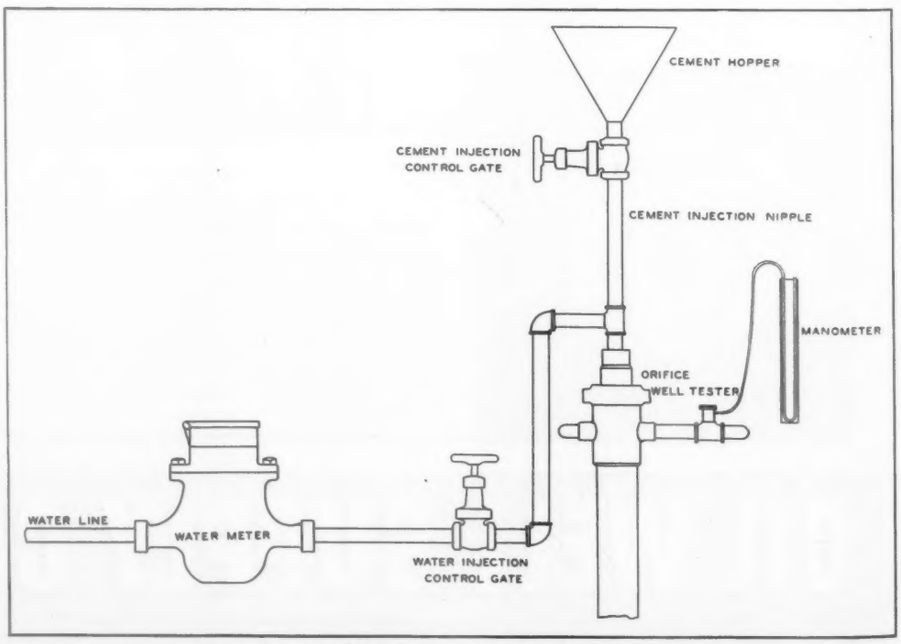
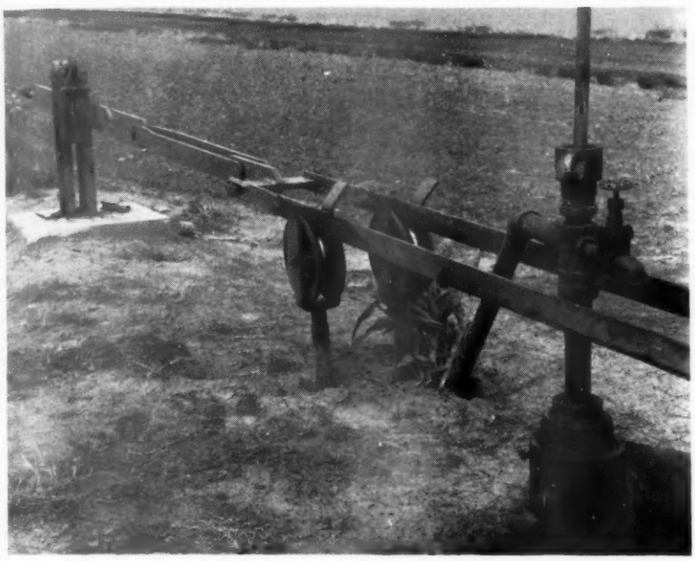


Fig. 1—Surface-control equipment for filtration-formation cementing

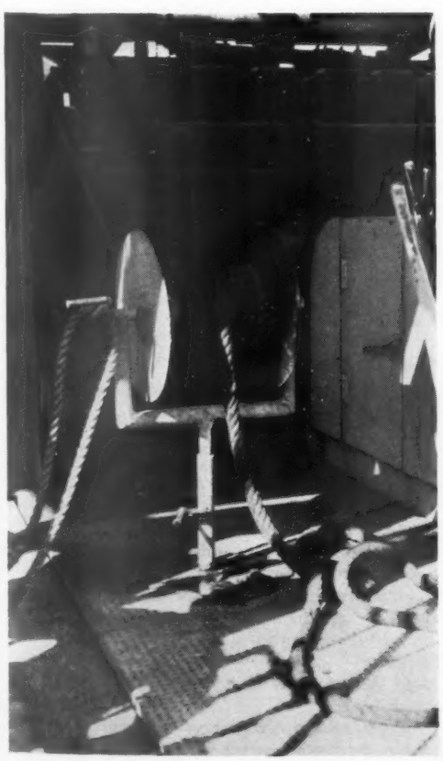
Operating Ideas



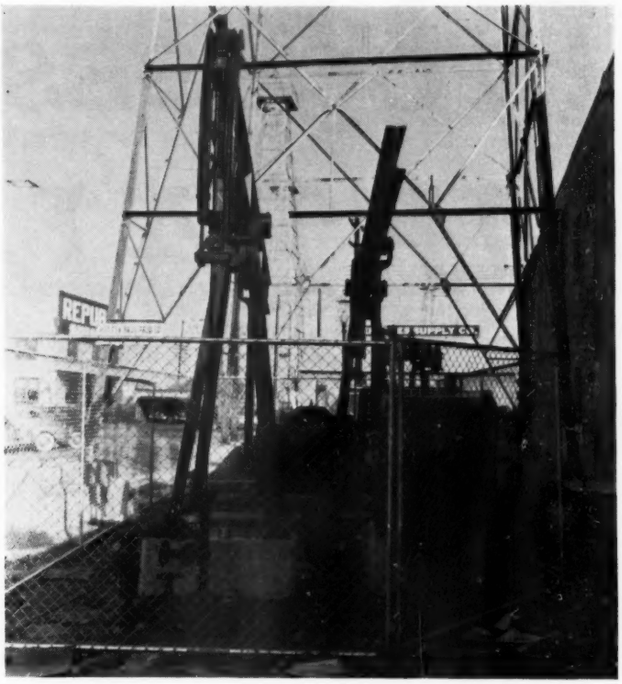
Roller Supports for Pull Bar on Backside Pump

One operator solved the problem of supporting the pull bars on a back-side pumping arrangement by installing a pair of pulleys on pipes driven into the ground immediately in front of the well head on the power unit. The pulleys guide the bar while the jack is on the pump and support them when the rod line is disconnected.

Antikink Reel for Catline Also Provides Storage



Backtwist which causes kinks in the catline can be easily removed by this revolving reel which at the same time provides an excellent storage for rope. It is provided with a crank for winding the rope on the drum and a lock on the vertical support which holds the reel stationary. To take backtwist out of the rope it is only necessary to unlock the vertical support and twist the reel counter-clockwise. A California drilling contractor uses this device on his rigs. Proper care of the catline, particularly the avoidance of kinks, not only increases the life of the rope but insures against its failure at a critical time.



Two Units Operated by One Gear Box and Engine

Townsite drilling often brings about the development of equipment which will meet space requirements. The accompanying photograph shows the method used by one operator to pump two wells which were only about 16 ft. apart. A gear box with twin cranks and an engine were installed. Single-crank pumping jacks were then placed over the wells and connected to opposite sides of the gear box. Each of the jacks, the engine and the gear box is set on its individual concrete foundation. No counterbalancing was needed on the beams as the load in one well is balanced by the other. Both wells are producing from the same sand, Texas law basing the allowable on a per-well basis. In this case there are six wells on a strip about 150 ft. long and 16 ft. wide. The heavy wire fence prevents injury to casual visitors.

Storage for Wire Lines When Not in Use

Wire lines on tubing units must be changed for different tasks and one firm has installed the storage rack shown for removing, storing, and reinstalling lines. The cathead at the right can be used for spooling line on the rack and it can also be used for applying strain on the line while it is installed on the tubing-unit drum.

Progress in METALS

By W. L. NELSON

Reinforced Cast Iron

Abstract: "Reinforced Cast Iron and Its Applications," by N. Levanov, Foundry Trade J., Vol. 64, May 22, 1941, p. 346, and from Vestnik Metallopromyshlennosti No. 12, 1939, pp. 11-18. Taken from Metals and Alloys, September 1941.

THE supporting capacity of cast-iron members may be increased by incorporating in them during casting a reinforcement of mild steel bars.

Experimental work has shown that the mild steel should have a carbon content of 0.10 to 0.25 per cent, and should have a perfectly clean surface, free from rust, scale, or other contamination. The iron should be poured at a temperature of 2300° to 2516° F.

Metallographic examination shows that the diffusion of carbon from the cast iron into the steel produces in the latter a surface cementation layer, underlying which is a pearlite zone, while in the central portion the original ferrite-pearlite structure remains unaltered. In the cast-iron zone immediately adjacent to the steel, the structure is that of a eutectoid steel. This is followed by a zone having a sorbitic structure, while farther away from the reinforcement there is evidence of a reduction in size of the graphite flakes.

In furnace construction, where high durability under severe temperature conditions is required, this reinforced cast iron has been found very suitable. In structural engineering reinforced cast iron has been successfully employed for the lining sections of the Moscow underground railway.

Under test, these sections of reinforced cast iron were found to have a supporting capacity 40 per cent greater than that of similar sections of cast iron without reinforcements.

New A.S.T.M. Specifications for Boiler and Superheater Steels

THE American Society for Testing Materials (260 Broad Street, Philadelphia, Pa.) in its release dated September 10, 1941, announces two new steel specifications.

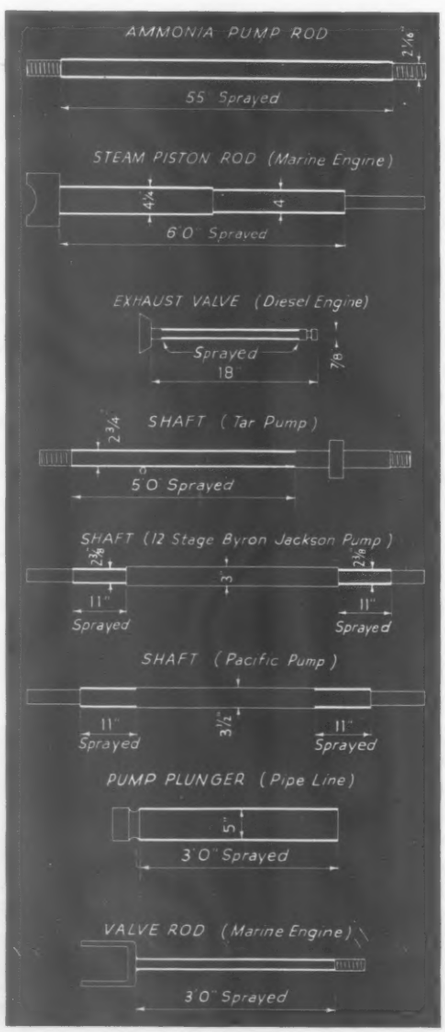
One specification covers carbon-molybdenum material fabricated by electric-resistance welding (A 250-41T) the other covers four grades of austenitic steel fabricated either by electric-resistance or the atomic-hydrogen arc-welding process (A 249-41 T).

Each of the specifications sets up recognized flattening, flaring, and hardness tests, and also standard hydrostatic tests. The three grades of carbon molydenum material are differentiated by chemical and mechanical requirements, tensile strength, for instance, being 53,000, 55,000, and 60,000 lb. per sq. in. with Brinell hardness values of 137 and 143.

Five grades are covered in Specifications A 249, chromium-nickel, chromium-nickel-titanium, chromium nickel-columbium, and two types of chromium-nickel molybdenum. Minimum tensile requirement is 75,000 lb. per sq. in., yield point, 30,000 lb. per sq. in, with minimum elongation in 2 in. of 35 per cent.

Salvaging of Worn Equipment

THE building up of worn surfaces of machine parts is a direct way to aid in the conservations of strategic metals and allows—and may enable some operators to avoid the delays of priority ratings. In 1 month, over 2,580 lb. of scarce alloys and steels were saved by one large petroleum refiner. In so doing, the actual metal consumed by the repairs, amounted to less than 103 lb. The nature of the parts that were salvaged by metallizing is indicated in the figure on this page. The worn surfaces indicated in the sketches were built up to proper dimensions by spraying such alloys as monel, nickel steel, and 13 per cent stainless chromium steel, onto the worn surfaces by the process known as metallizing.



Welding Terms

Brazing

THE American Welding Society gives the following tentative definitions of terms related to brazing:

Brazing.—A group of welding processes wherein the filler metal is a nonferrous metal or alloy whose melting point is higher than 1000° F. but is lower than that of the metals or alloys being joined.

Chemical dip brazing.—A dip-brazing process wherein the filler metal is added to the joint before immersion in a bath of molten chemicals.

Dip brazing.—A group of brazing processes wherein the heat is obtained from a bath of molten metal or chemical; the filler metal may or may not be obtained from the bath.

Electric brazing.—A group of brazing processes wherein heat is obtained from electric current.

Furnace brazing.—A brazing process wherein the heat is obtained from a furnace.

Gas brazing.—A brazing process wherein the heat is obtained from a gas flame.

Induction brazing.—An electric-brazing process wherein heat is obtained from induced current.

Metal-dip brazing.—A dip-brazing process wherein the filler is obtained from the molten-metal bath.

Resistance brazing.—An electric-brazing process wherein the heat is obtained from the resistance to the flow of an electric current.

Silver-alloy brazing. — (Silver soldering). — A brazing process wherein a silver alloy is used as a filler material.

Covered or Shielded Welding

A COVERED or coated electrode is a metal electrode which has a relatively thick covering material serving the dual purpose of stabilizing the arc and improving the properties of the weld metal. The coating protects the weld to some extent from the action of the oxygen in the atmosphere.

The shielded welding processes, either by the carbon arc or the metal arc, are conducted so that both the arc and the weld metal are protected from the atmosphere of a shielding medium such as hydrogen. At the high temperatures attained in a welding process the metal tends to combine with the oxygen of the air to form insoluble metal oxides in the weld.

Irregularities in Welds

IRREGULARITIES in the surface or interior of a weld are defined by the American Welding Society as follows:

Crater.—A depression produced by the termination of an arc weld.

Collar.—The reinforcing metal of a nonpressure thermit weld.

Flash (fin).—Metal expelled from a joint made by the resistance welding process.

Gas pocket or blowhole.—A cavity in a weld caused by gas inclusion.

Porosity.—The presence of gas pockets or inclusions.

Slag inclusion.—Nonmetallic material entrapped in a weld.

Overlap (roll).—Protrusion of weld metal at the toe of a weld beyond the limits of fusion.

Service on Active Fields

RURAL HILL FIELD (T. 6s, R. 5e), HAMILTON COUNTY, ILLINOIS

Compiled by The Oil and Gas Journal

Terrain

Rather hilly. Surface is a soft, powdery clay which cuts easily and makes dust during dry weather and thick mud during the rainy season.

Supply stores and truck services

McLeansboro, Benton, Fairfield, Mount Vernon and Carmi are within easy driving distance.

Water supply and fuel

No water or gas system in the field. Trucks haul water from creeks and ponds and deliver fuel to the rigs.

EARLY DEVELOPMENT

Shell Oil Co., Inc., opened the field with 1 C. Ventress, NE SW SE 12-6s-5e, in the lower O'Hara (Levias) sand at 3,184-91 ft. The Levias lime is in the upper Ste. Genevieve formation and is above the Fredonia lime. This well also had saturation in the Cypress sand at 2,865-2,953 ft. but the sand was poor. The Aux Vases sand showed it had possibilities when the well made 150 ft. of oil and the same amount of mud on a drill-stem test opened 1½ hours at 3,112-32 ft.

Kingwood Oil Co. drilled 1 Bertie Johnson, NE SE NE 14-6s-5e, to the Aux Vases pay at 3,169-88 ft. and the well flowed 800 bbl. after being shot. Cameron Oil Co. then took over Halbert 1 Lockwood, NW NW NE 23-6s-5e, which had been drilled through the McClosky to 3,256 ft. and given up as a dry hole. The Aux Vases when cored did not look favorable, possibly because the best part of the sand was not caught in the core barrel.

Fourteen hours after Cameron took over the well, the hole was cleaned out to bottom, cement dumped in and pipe run. The plug was then drilled and the well flowed 1,040 bbl. through the casing from Aux Vases sand at 3,083-3,117 ft.

Later drilling in the field showed the McClosky sand also to be productive, giving the field three producing formations and possibly a fourth.

There have been two dry holes drilled in the field, the first being the Kingwood 1 Hatcher, NW NW NE 14-6s-5e, which missed the sand and was approximately 41 ft. lower than the Bertie Johnson well; pipe was run to the McClosky at a total depth of 3,453 ft. Its failure did not necessarily limit the field. A test drilled by Shell to 953 ft. on the Agnes Brooks offsets the dry Kingwood 1 Hatcher. A little over ½ mile to the southeast of the field, the Smokey Oil Co. 1 J. D. Cluck was dry at 3,342 ft.

Above the Aux Vases sand the Chester sands vary in thickness and the base of the Renault is the zone preferred for contour work. The basal Renault is a white lime showing chocolate to red oolites which make it easy to identify. The Golconda shale is about 35 ft. thicker at Rural Hill than it is in the Hoodville pool.

Structure

Regional dip in the Rural Hill area is to the north. The local structure is a dome with a sharp reversal and it may produce a long way down on the sides. One well is 40 ft. lower than the discovery well and it made a very good producer in the Aux Vases sand. It is believed that the field will be approximately 3 miles long and about 1 mile wide. There may be embayments in the structure where the sands lense in and out and thus narrow the field.

Discovery method

The general vicinity was first worked with seismograph by Pure Oil Co. as early as 1937 with the discovery of the Stokes-Storms, Irons area resulting. This first shooting was south of the Rural Hill structure. Texas Co. later shot more intensely and as a result bought heavily in the Hoodville-Dale area which is about 10 miles to the northeast. Shell Oil Co., Inc., reworked the area with seismograph and found an interesting picture at what is now the Rural Hill field. Core drills were also used to obtain data on the area.

Formation tops

Tops of the formations in the discovery well are as follows (elevation 492 ft.): Kincaid 1,912 ft., Degonia 2,046 ft., Clore 2,095 ft., Palestine 2,150 ft., Menard 2,287 ft., Waltersburg 2,354 ft., Vienna 2,422 ft., Tar Springs 2,430 ft., Glen Dean 2,510 ft., Hardinsburg 2,576 ft., Golconda 2,676 ft., Benoist 3,067 ft., Renault 3,086 ft., Aux Vases 3,120 ft., and Ste. Genevieve 3,144 ft.

OWNERSHIP OF PRODUCING WELLS

At the present time there are 21 completed oil wells in the field and 42 active operations including locations, wells drilling and completing. Shell Oil Co., Inc., and the Texas Co. own the bulk of the productive territory and a steady, instead of a spectacular, development is in progress. Following are the companies owning producing wells and the number each has on production.

Shell Oil Co., Inc.	2	Kewanee Oil Co.	2
Reward Oil Co.	2	Kingwood Oil Co.	4
Texas Co.	7	Schoenfeld, Hunter & Kitch	1
Magnolia Petroleum Co.	1	Cameron Oil Co.	2

Spacing pattern

By request of the federal coordinator of petroleum, a spacing of 10 acres for the sand wells and 20 acres for the lime wells is being followed. The state Department of Mines, which has authority to issue permits, is reluctant to do so unless small leases are unitized. Unitization has been necessary in a few cases.

DRILLING AND COMPLETION

Types of rigs

All of the drilling is done by the rotary method to the casing point and the wells are then completed with cable-tool machines. Both types of rigs are highly unitized, the rotaries generally being powered by two engines and the cable-tool rigs by a single engine. Most of the rotaries operate under regular 96-ft. derricks although a few portable derricks are in use. Cable-tool rigs generally furnish their own mast.

Drilling time

Approximately 12 days to move in rotary, set surface pipe, drill the hole to the casing point and run pipe. A 72-hour wait for cement is used for moving off rotary and moving in the cable-tool rig. Seven to 10 days are then required to drill the plug, shoot and clean out.

Casing and hole size

Some companies drill 8¾ or 9-in hole and run 7-in., 20-lb. pipe. Others are using 5½-in. casing in a 7¼ or 7¾-in. hole. One company is using 4½-in. pipe in a 6¾-in. hole. Casing is generally equipped with guide shoe, float collar and centralizers. Scratchers are also used. Drill pipe used is 4½ or 3½-in. depending on the size of the hole.

Cement

The long string of pipe is cemented with from 400 to 500 sacks of cement. Some companies use 3 per cent Aquagel in the slurry.

REED TOOL JOINTS

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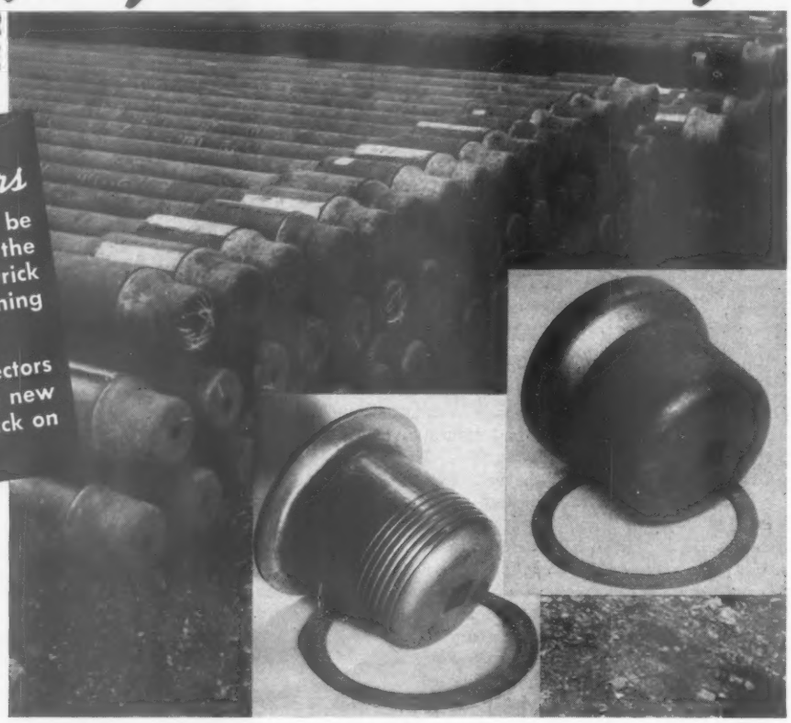
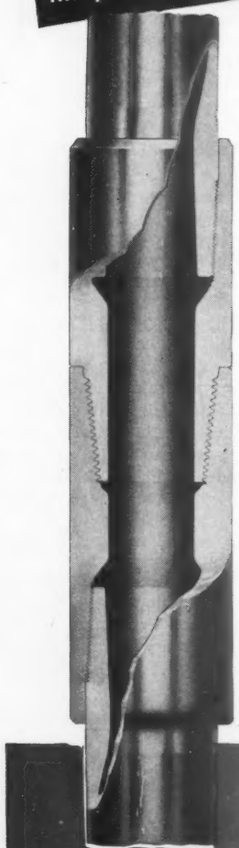
SUGGESTIONS FOR THEIR CARE AND MAINTENANCE
(ONE OF A SERIES)

USE YOUR *Thread Protectors*

Thread protectors should be left on tool joints until the pipe is put on the derrick floor preparatory to running in the hole.

Replace all thread protectors when moving pipe to a new location or placing it back on the pipe rack.





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Reed Tool Joint threads are accurately designed and machined, and the utmost importance should be given their care and maintenance. Proper care will greatly increase their service life and give added assurance of "more wells per string."

REED ROLLER BIT COMPANY
POST OFFICE BOX 2119
HOUSTON, TEXAS, U. S. A.

EXPORT OFFICE, 30 ROCKEFELLER PLAZA, NEW YORK

Number of bits

First wells took from 18 to 20 rock bits but this has been cut down to 14 to 16 bits and will probably go a little lower as drillers become acquainted with the field. One core head is generally used.

Drilling conditions

Typical of Illinois. Drilling rate is high until 1,500 ft. is reached and it slows down from there on. Streaks of hard sand and lime in the Pennsylvanian and Mississippian impede the drilling. Sand at 1,800-60 ft. and limy sand 1,930-60 ft. are noticeable. Sand at 2,070-2,200 ft. is rough and hard in spots. There is also a hard streak at 2,835-60 ft.

Weight and rotary speed

All weight of the drill string is carried on the bit to 1,500 ft. and below that from 25,000 to 30,000 lb. is used. Speeds start in at 150-200 r.p.m. on top of the ground, decrease to 100 r.p.m. at about 1,000 ft. and 85 r.p.m. to the total depth. While running in hard sands, the rotary table is slowed to 40-50 r.p.m.

Mud

Weight and viscosity are kept as low as possible until the Glen Dean is reached. Mud is then brought up to 38 sec. A.P.I. viscosity and around 10 lb. per gallon. The Golconda shale is troublesome and has a tendency to slough. Several strings of pipe have been stuck. About 150 sacks of bentonitic admixture are used on most wells.

Completion

Practices vary. Several have run pipe to bottom and then gun perforated with from 50 to 85 shots. The lime completions are mostly made by running pipe to the top of the pay and then acidizing with from 4,000 to 9,000 gal.; 5,000 gal. is generally used. An unusual method is used by one company for completing its Aux Vases sand wells. Pipe is run to the top of the formation and then the wells are shot in the bottom of the pay and in the top of the underlying Ste. Genevieve formation. The record of one well is typical; Aux Vases sand was at 3,168 ft. and the Ste. Genevieve was at 3,198 ft. with the 40-qt. shot being placed at 3,180-3,200 ft. Shots vary from 20 to 70 qt. and average 46 qt. Average total depth of the wells is 3,226 ft. with the casing run to 3,182 ft. Initial production of the Aux Vases wells has been 567 bbl., for the lime wells 549 bbl. and the combinations wells, 506 bbl.

Tubing size

Two and one-half inch EUE or 2-in. EUE tubing is used.

Tank batteries

Central tank batteries with one or two separators. As some of the wells produce heavily the batteries some times have as much as 3,000 bbl. storage.

Pumping units

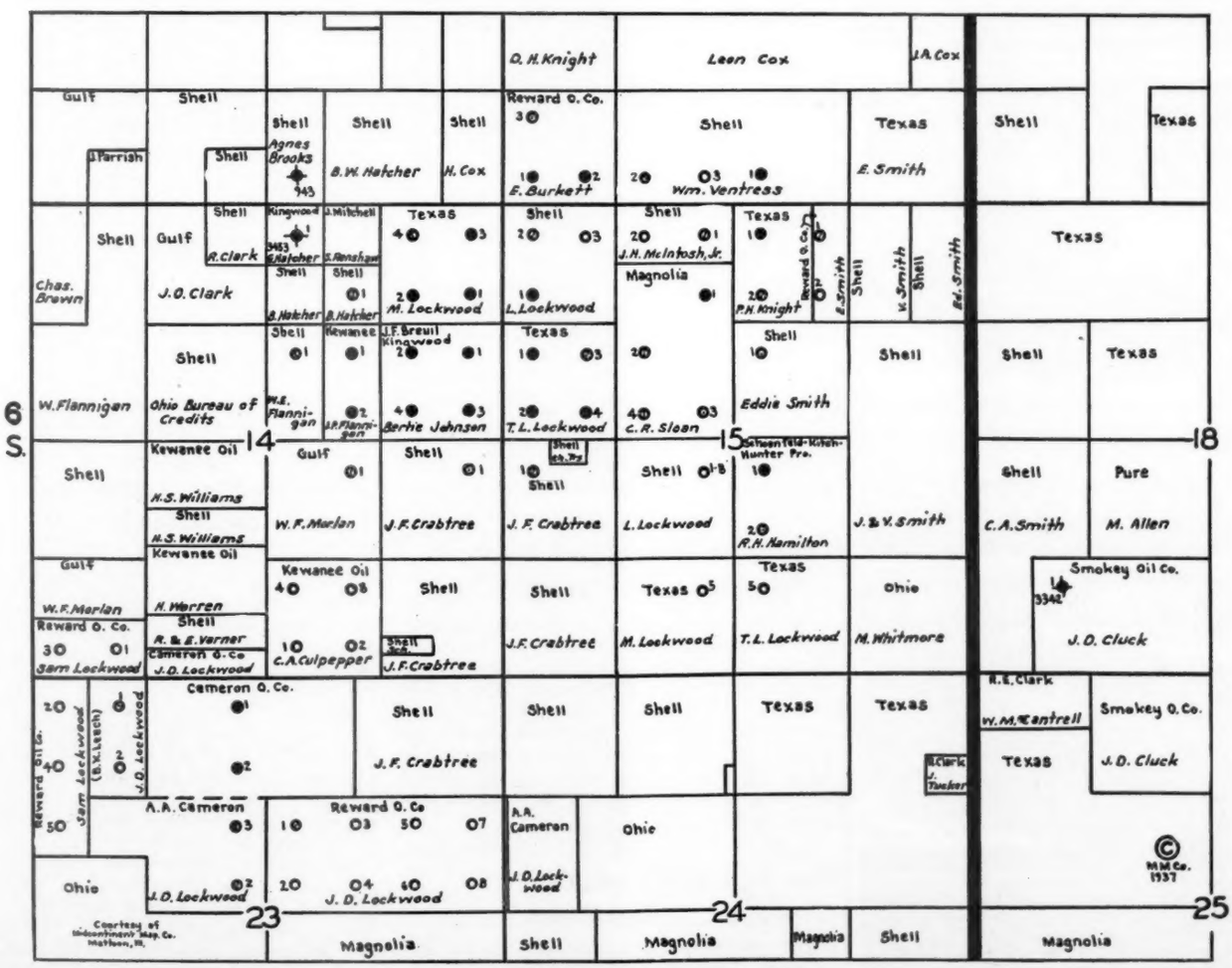
Pumping units are being installed as the wells near the end of their flowing life. Most of these are driven by internal-combustion engines.

Pipe-line outlet

Shell Pipe Line Co., Texas Pipe Line Co., Sun Oil Co. and Sohio Pipe Line Co. purchase in the field. Lines from the field enter the Illinois system at Hoodville.

Characteristics of crude

39°-39.1° corrected; 0.3 per cent basic sediment and water.



Map of Rural Hill field, Hamilton County, Illinois

CRC

PIPE LINE CONSTRUCTION EQUIPMENT

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Pipe Line Equipment and Materials
Houston, Texas, U. S. A.

Dig Trench the Fastest, Cheapest Way—

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Pipe-Line Activity

Stanolind Will Soon Complete Washington-Freeman Loops

Stanolind Pipe Line Co. will complete the looping of its trunk line between Washington, Kans., and Freeman, Mo., within a week to 10 days, provided the weather is good. Two loops have already been finished which have raised the capacity of this section of the system to 38,000 bbl. per day. Work is progressing on two additional loops. When they are finished the total capacity will be raised to 45,000 bbl. per day.

Stanolind Pipe Line Co. is preparing to test the last of the loops laid this year on the trunk line from North Texas to Whiting, Ind.

American Liberty Pipe Line Requests Review of Tax Case

American Liberty Pipe Line Co., Dallas, Tex., has asked the federal Board of Tax Appeals to review the finding of the Internal Revenue Bureau that the company allegedly is deficient to the extent of $178,527 on income taxes and surtaxes on undistributed profits for the fiscal years ended November 20, 1937, and 1938.

The company contends that it actually overpaid its tax assessment for those years and that the bureau errs on several counts in computing its tax liability. The company deducted $568,809 in 1937 and $270,710 in 1938 for discharge of debt, which the bureau holds was not a proper credit under the provisions of Section 26(C) of the Revenue Act of 1936. The bureau also allowed no deduction for inventory price decline and held that there was a taxable gain of $127,000 on 12 oil wells sold by American Liberty.

Chapel Hill-East Texas Line Ready for Use

The first gas will move this week through a 14-mile 6-in. pipe line from Chapel Hill field in Smith County to the west edge of the East Texas oil field, it was announced Friday.

The line extends from the Sallie Walton lease in the Chapel Hill field to the Clayburn lease on the west edge of the East Texas field. Lateral lines extend 5 miles south and 10 miles north and more will be added as needed to provide gas lift for wells on the west edge of the pool.

Oklahoma Natural Gas Enlarges System Serving Oklahoma City

Facilities for supplying gas to Oklahoma City, Okla., are being enlarged by the construction of 7 miles of 16-in. line from the South Canadian River to the vicinity of the airport. This will be connected at one end with lines transmitting gas from the Chickasha and Cement fields and, at the other end, with the company's belt system at Oklahoma City. The line will be completed within a few days by the contractor, E. M. Campbell Construction Co.

Kaw Pipe Line Expands Outlets for Kansas Fields

Kaw Pipe Line Co. will complete by the end of this month the 40-mile line now under construction between the Ray pool, Kansas, and Bemis, Kans. All of the pipe has been strung, 30 miles of ditch has been dug and 27 miles of line have been completed.

Kaw Pipe Line Co. has concluded negotiations for an option to purchase 20 miles of 12-in. and 20 miles of 10-in. from a gas system in the vicinity of Lima, Ohio. Much of this line has been laid under highways and it is uncertain how soon it will be possible to recover this from the ground. It is the intention of the company to use this pipe if it is acceptable for the new line contemplated in the vicinity of Chase, Kans.

Bell Western Operates Fargo Pool Outlet

Bell Western Pipe Line Co., subsidiary of the Bell Oil & Gas Co. of Tulsa, has announced it was making preparations for an initial run of crude oil through its 4-in. pipe line from the Fargo pool of northern Wilbarger County, Texas, to the Bell's refinery at Grandfield, Tillman County, southern Oklahoma, a distance of 20 miles.

The Fargo pool, discovered a year ago this month, now has 20 producing wells and has been without an outlet for its production since discovery.

Completion of an outlet for the pool is expected to stimulate development in the pool, which is producing from four different pays.

The Bell company has been trucking oil to its Grandfield plant.

Standard of Indiana Completing Indianapolis Line

Standard Oil Co. (Indiana) expects to complete the 8-in. gasoline pipe line from Whiting to Indianapolis, Ind., on November 5. The line will be put into operation immediately after completion. Gasoline and finished products will be pumped for the entire distance of 150 miles from the company's refinery to the Indianapolis terminal by one pumping station. The line has been designed for operation at pressures as high as 1,000 lb. However, at the beginning of operations the line will handle not more than 5,000 to 8,000 bbl., which quantity is considerably below the capacity of the system.

Promoters Seek Approval of Texas-Georgia Line Plan

Organized labor is cooperating with the Trans-American Pipeline Corp. "with finances as well as effort" in the attempt of the pipe-line company to get approval from defense officials for construction of a proposed crude pipe line from northern Texas to Savannah, Ga., the company has announced.

Emmett C. Davison, general secretary of the International Association of Machinists, TAPCO declared, is back of the corporation and its program and "views his participation as a concrete example of labor unions plowing their financial support back into productive enterprise and strengthening the American economy."

The proposed pipe line would originate at Wichita Falls, Tex., and run due east for 1,050 miles to Savannah. It would have a capacity of approximately 70,000 bbl. of crude daily. Testifying before the Maloney subcommittee during its recent hearings on the eastern shortage of petroleum products, representatives of TAPCO stated that the proposed pipe line, if constructed in accord-

Pipe-Line Personalities . . . . . Guy S. Connors

GUY S. CONNORS, general superintendent, Williams Brothers Corp., Tulsa, was born at Eau Claire, Wis. After finishing high school in Idaho, he attended the University of Idaho, where he studied engineering. For a number of years he was engaged in lumbering and railroad-construction operations, carried on in Idaho, California, Washington, and Wyoming in the United States and British Columbia and Alberta in Canada. He participated in the construction of the first transcontinental railroad in Canada which was built to Prince Rupert, B. C., by the Canadian National system. He was connected with the part of the construction of this project which was contracted by his father. In 1923 he joined the Williams Brothers organization which, at that time, was building a 100-mile, 12-in. natural-gas line from the Viking field to Edmonton, Alta. From 1923 to 1926 he followed an unusual practice for pipe-line construction men. During this period he worked on pipe-line projects contracted by Williams Brothers in the United States. Most of these were located in the South. In the winter months he was associated with his father in lumbering operations, carried on in the forests of Alberta.

In 1931 he became vice president of Williams Brothers Corp., and in 1935 he became a member of the firm. As general superintendent he supervises all of the construction work of this organization, which operates in all parts of the country. In the last few months he has been spending a large part of his time in the New England states and the Province of Quebec, where the Portland-Montreal crude-oil pipe line is being built, and in the southern states where construction is in progress for the Plantation Pipe Line Co. He resides in Tulsa with his wife and daughter.

ance with their plans, would be built with federal funds and operated as an independent carrier.

They proposed to obtain crude oil from independent producers in the northern Texas fields and transport it to the East Coast. There, they explained, it could be taken by barge to refineries several hundreds of miles to the north.

Questioned concerning who was behind TAPCO, Mr. Ickes, at his press conference last Thursday, bluntly answered, "A bunch of promoters." Officials of the company are easy to locate, he said in reply to another question, because "they spend most of their time up on the hill."

It is reported that interest in the proposed pipe line has been manifested by Senator Spencer of Arkansas, Senator O'Daniel of Texas, and Senator Overton of Louisiana.

Aldace Freeman Walker, executive vice president of Trans-American, is a son of Harold Walker, formerly counsel for the Standard Oil Co. of New Jersey.

E. Stanley Glines, engineer, formerly connected with Stone & Webster operations in the Orient, is president of the corporation

SEC Hearings on Panhandle Eastern to Be Resumed

WASHINGTON, D. C.—The Securities Commission has permitted Missouri-Kansas Pipe Line Co. to take part in integration proceedings against the Columbia Gas & Electric Corp. system in so far as it concerns Panhandle Eastern Pipe Line Co.

The commission granted Mokan's request for permission to adduce evidence, crossexamine witnesses, file briefs and present oral argument, but did not grant it the status of a party to the proceeding.

Mokan has based its application on the assertion that it owned 42 per cent of the Panhandle common stock.

At the same time the SEC granted participation privileges to William H. Danforth, who said that he owned 98,756 shares of common stock of Columbia Oil & Gasoline Corp., and to Abner Goldman, who said he owned 500 shares of common stock of Columbia Gas & Electric Corp.

The commission ordered the hearing resumed on October 28. Named as respondents in the action along with Columbia Gas, Columbia Oil and Panhandle are Michigan Gas Transmission Corp. and Indiana Gas Distribution Corp.

Proposals Are Considered for Supplying Oklahoma Towns

Negotiations are in progress to provide a natural-gas supply for the towns of Sperry and Skiatook, Okla.

Union Gas Co. had pleaded that the gas supply in its Osage County, Oklahoma, wells was exhausted, and as a result permission to stop service in the two towns was sought.

A petition before the Corporation Commission to force the Natural Gas Service Co., distributor, to continue service will be dismissed. The case was slated for hearing later this month.

Arrangements are being discussed to tie in the Natural Gas Service Co. lines with those of the Oklahoma Natural Gas Co.

Meantime, auxiliary lines which already extend toward the Skiatook vicinity, and the abandoned lines of the Union Gas Co., can be utilized while the new system is under consideration.

Natural Gas Pipeline Proceeds With Nebraska Construction

Construction work of Natural Gas Pipeline Co. of America for the laying of 32 miles of 26-in. pipe in eastern Nebraska is nearly half completed and it is anticipated that this part of the company's program will be finished during the first half of next month. Delay in starting work in Nebraska was caused by difficulties encountered in moving the equipment of O. E. Dempsey Construction Co. across the Missouri River from Iowa where this contractor completed construction of 67 miles of 26-in. early this month. The privately owned bridge across the river at Plattsmouth, Neb., was not strong enough to bear the weight of the heavy construction equipment. It became necessary to ship this equipment across the river on barges. Since all available barges had been leased for government work it was necessary to wait for idle time in the Government's program in order to get the use of the barges.

Weather conditions have been favorable but there was some delay due to difficulties in obtaining right-of-way. Pipe deliveries are scheduled to come to the Nebraska project at the rate of 1½ miles per day.

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Book Department

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions ran slightly ahead of last week but are still below the high level maintained during August and September. Compared with last week, oil wells were down 26 to 413, gas wells down 1 to 61 and dry holes were up 35 to 161. The number of dry holes is at about the same level as during recent months so that it appears as though oil-well completions were entering a downward trend.

If 1940 completions are considered typical of the amount of drilling required to maintain production at last year's rate, it will be found that the weekly average of completions last year was 578 of which 406 were oil wells. Last week's oil-well completions were getting very close to this average, although last week's daily average production was more than 460,000 bbl. above that of 1941.

It has recently been stated that 30,000 wells must be drilled in order to maintain production at the present rate but the outlook is for more production rather than maintenance of the current rate. Already existing wells plus the normal number of completions have been required to step up daily average production nearly half a million barrels above last October's level. It has been stated that this year's discoveries are not as large as in previous years and that there are now fewer than the average number of undrilled locations. If this is correct, it is possible that the estimate of 30,000 wells is too low. What appears to be needed is a total of more than 21,500 oil wells together with a larger-than-average number of dry holes. Expressed somewhat differently, we must maintain our discoveries at an increasing rate if the magnitude of individual discoveries is below normal in order to provide us with locations for the more than 21,500 oil wells. This means an increased tempo for exploration.

The reported finding of shows in the Wilcox in Mississippi is particularly important as the find is well north of the trend as projected from the rapidly developing Wilcox area in Central Louisiana. Three of the four prospects reported for California last week have materialized.

MISSISSIPPI: The first show of oil from the Wilcox to be found east of the Mississippi River has been reported from the Magnolia wildcat in Warren County, southwest of Tinsley. The oil is heavy, black and low in gravity. The zone will be tested (p. 100).

COLORADO: Gas has been found at a lower sand in the Wasatch at West Hiawatha (p. 80).

ILLINOIS: A new McClosky pool south of Johnsonville is assured and two in Richland County are possibilities. Louden's deep test got a noncommercial showing in the Trenton and is headed for the St. Peter. The old Wamac pool near Centralia may be revived as the result of an 84-bbl. well in the Petro (Pennsylvanian) sand, the regular pay which was thought almost depleted (p. 74).

SOUTHWEST TEXAS: A test about 2½ miles northeast of gas-distillate production at La Reforma is showing oil in the Frio-Vicksburg. Stratton oil production has been extended into Kleberg County (p. 88).

OKLAHOMA: The second Wilcox has been found productive at Apache. The McLish discovery at Cumberland is being deepened, presumably to test the Arbuckle. At Guthrie, the long-delayed townsite test reports some saturation in the second Wilcox (p. 71).

LOUISIANA GULF COAST: After the deep discovery pay was abandoned in the Bastian Bay discovery well, two gas-distillate sands and a gas sand have proved productive. A deep sand, believed to be basal Frio, has been found on the south flank of Welsh. The Lapeyrouse and Point au Fer discoveries have been completed as gas-distillate wells (p. 98).

TEXAS GULF COAST: Two upper Frio sands are to be tested in a wildcat south of Rowan. A test on the northwest flank of Big Hill tried to blow out at 7,042 ft. Another new sand has been found at Hull more than ¼ mile east of former production (p. 93).

WEST TEXAS: After getting production in the Simpson, Continental is preparing to deepen its test south of the Sand Hills extension area. Upton County's deep test is below 10,000 ft. (p. 84).

CALIFORNIA: The Helm discovery in Fresno County appears to be of major importance as one Eocene and two Miocene pays have been proven and the operator is testing another possible Miocene pay. At Jacalitos dome, the discovery well made 128 bbl. from the Temblor. The shallow Turnbull Canyon discovery well in the Whittier district, Los Angeles Basin, appears to be a good pumper. The state's fourth prospect, the Pico anticline test, has shown nothing on a test below 6,000 ft. (p. 90).

MICHIGAN: Due mainly to Reed City, completions in September ran about 70 per cent above August's record. Another north extension is recorded this week (p. 97).

NORTH LOUISIANA: Deep wildcats share interest with the active Wilcox trend play. An abandoned test in the Waskom district made a 10,000,000-cu. ft. gasser after reworking (p. 70).

INDIANA: The Hazleton pool in Gibson County assumes added importance as the second well came in for 325 bbl. in the McClosky. The discovery ½ mile to the northeast made 288 bbl., natural (p. 78).

ARKANSAS: The second producer at Macedonia has proved to be one of the best gas-distillate producers in the state. A third well is also showing (p. 70).

NORTH TEXAS: A Caddo lime producer has opened a new pool in northwest Jack County and the same formation is also showing in a Montague County test northwest of Bowie (p. 72).

WYOMING: Possibilities for a major field in the Byron-Garland area were increased when the discovery well at Byron was deepened 70 ft. without finding water. This well is the lowest in the field. A test of the Circle Ridge dome, north of Maverick Springs, found oil in the Embar with the best pay at 212 ft. and is testing the Tensleep at 320 ft. A test has been started on the Southwest Lance Creek structure (p. 80).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended October 18, 1941)

	Oil	Gas	Dry	Total	1941 total comp. to date	1940 total comp. to date
N. Y., Pa., and W. Va.	93	21	4	118	4,724	4,504
Ohio	1	14	9	24	1,333	1,218
Indiana	4	1	6	11	405	332
Kentucky	0	2	4	6	533	470
Illinois	68	1	20	89	2,909	3,090
Michigan	9	1	6	16	706	927
Kansas	22	4	18	44	1,763	1,481
Nebraska	0	0	0	0	72	35
Missouri, Iowa	0	0	2	2	32	29
Oklahoma	22	2	12	36	1,526	1,515
Texas:						
North Central Texas:	33	1	24	58	2,193	2,226
West Texas	33	0	4	37	1,796	1,543
Texas Panhandle	11	2	0	13	533	463
Eastern Texas	16	0	3	19	859	491
Texas Gulf Coast	16	0	4	20	868	964
Southwest Texas	21	8	13	42	1,496	1,728
Total Texas	130	11	48	189	7,745	7,415
North Louisiana	10	3	6	19	606	511
Louisiana Gulf Coast	11	0	4	15	696	815
Total Louisiana	21	3	10	34	1,302	1,326
Arkansas	5	1	8	14	158	138
Mississippi and Southeast	8	0	3	11	217	170
Montana	6	0	7	13	234	191
Wyoming	0	0	0	0	149	137
Colorado	1	0	1	2	27	12
New Mexico	3	0	1	4	224	514
California	20	0	2	22	901	823
Total United States	413	61	161	635	24,960	24,327
Total previous week	439	62	126	627		
Week ended Oct. 19, 1940	376	62	144	582		

Thirty-Five Rigs Drilling In Louisiana Wilcox Area

By R. MARNE SANFORD

SHREVEPORT, La., Oct. 20.—Some 35 rigs are active in Central Louisiana's increasingly active Wilcox sector of production. These are both proven field tests and surrounding wildcat operations. During the past week there were a total of 19 new locations staked in North Louisiana fields of which 11 were in the Nebo-Olla-Little Creek trend of fields through La Salle Parish. There were two wildcat locations made, one each in Rapides and Tensas parishes, the latter to be a Wilcox test and the former contracted to 7,250 ft. which will probably reach the Wilcox zone. Four of the locations were in the old Caddo field and two in the Urania field.

Reports at the close of the week had it that Carter Oil Co. was preparing to stake two new wildcats on the Beech Creek structure in Winn Parish and one location on the Maxwell Ferry prospect in extreme southeast corner of Winn Parish. Exact locations of these exploratory holes have not been released. Carter Oil recently leased from Urania Lumber Co. 2,500 acres and about 1,000 acres from small fee owners in the Beech Creek area. The block centers about at the intersection of Townships 11-1w and 11-1e, and Townships 12-1w and 12-1e. Carter Oil's Maxwell Ferry block was assembled south of Dugdomoma Bayou in the SE of Township 10-1w in Winn and the NE of Township 9-1w in Grant parishes.

As for deep wildcats in the North Louisiana area there are three which are below 8,000 ft. East of Haynesville in Claiborne Parish, Hunt Oil 1 Mitchiner, 15-23-7, was last reported at 8,000 ft. In the same parish and north of Lisbon the Union Producing Co. 1 MacDonald, 13-21-5, was drilling at 8,507 ft. in shale. Hunt Oil 2-A Louisiana Central, NW SE 9-9-6, in Catahoula Parish, was fishing lost drill pipe at nearly 9,000 ft. All of these tests are deep for their respective areas. However, the two in Claiborne Parish are seeking the deep Smackover lime usually found below 9,000 ft. in that sector. The Catahoula Parish exploratory test is below and out of the Wilcox zone and is one of the deepest tests ever drilled in the area.

Abandoned Hole Reworked Makes Gas Well

In the Waskom district of Caddo Parish and in NW SE 13-17n-16w, a previously abandoned outpost has been reworked and completed for 10,000,000 cu. ft. of gas daily, open flow. The well is Delta Drilling Co. 1 Thigpen-Herold and was completed for a commercial gas well at a total depth of 2,981 ft. through casing perforations from 2,616-18 ft. The pressure showed 1,150 ft. at the bottom of the hole. Completions of this well will open to drilling considerable acreage though condemned several weeks ago at the then believed failure of the well. No new drilling has been indicated as yet, however.

● SUMMARY OF COMPLETIONS ●

North Louisiana

	No.	Bbl.	Footage
Oil wells: Bellevue	2	24	818
Caddo	5	285	7,274
Little Creek	1	156	2,705
Olla	1	121	2,420
Zwolle	1	96	2,557
Gas wells: Wildcats	1	*10	4,092
Monroe	1	*3.16	2,185
Waskom	1	*10	2,981
Dry holes: Nebo	1	.....	4,005
Olla	1	.....	2,950
Pleasant Hill	1	.....	3,262
Sligo	1	.....	3,153
Wildcats	2	.....	8,026
Total	19	.....	46,428

Arkansas

	No.	Bbl.	Footage
Oil wells: Buckner	1	250	7,257
Dorcheat	1	185	8,910
Smackover	1	58	2,524
Stephens	2	325	6,901
Gas wells: Macedonia	1	*4.14	8,965
Dry holes: Wildcats	4	.....	7,844
Fouke	1	.....	3,817
Smackover	1	.....	2,622
Stephens	1	.....	3,485
Urbana	1	.....	3,561
Total	14	.....	57,886

East Texas Border

	No.	Bbl.	Footage
Dry holes: Pine Island	1	.....	2,140

*Million cu. ft.

NORTH LOUISIANA COMPLETIONS

Wildcats

Grant Parish: H. L. Hunt 4-F Goodpine, SE NW 16-8n-1e, top Wilcox 1,978 ft., dry at 4,643 ft.

La Salle Parish: Delta Drilling Co. 1 Hughes, SW NE SW 22-8n-1e, completed for discovery making 10,000,000 cu. ft. gas daily, Wilcox zone topped at 2,017 ft., perf. casing 1,462-65 ft., T.D. 4,092 ft., P.B. to 1,509 ft.

Red River Parish: Republic Production Co. 1 Timon, irregular section 39-11n-9w, top Saratoga, 1,445 ft., base Saratoga 1,500 ft., top Annona chalk 1,680 ft., base Annonal 1,790 ft., Blossom sand 2,122 ft., Austin chalk 2,830 ft., Lower Cretaceous 3,160 ft., massive anhydrite 5,163 ft., base massive 5,405 ft., top anhydrite stringer 5,495 ft., Pettit zone 6,208 ft., T.D. 6,383 ft., dry and abandoned.

Fields

Bellevue, Bossier Parish: C. H. French 8 Larkin, NE SW 14-19n-11w, pumped 4 bbl., 393 ft., T.D.

Premier Investment 61 Wyche, SE NW 14-19n-11w, pumped 40 bbl. oil and 20 bbl. water, 425 ft., T.D.

Caddo, Caddo Parish: Davis & Hart 8-A Muslow, SW NE 5-20n-15w, pumped 70 bbl. oil, 1,508 ft., T.D.

Claud Ferguson 2-B Chew, SE SE NW 4-20n-16w, pumped 15 bbl. oil, 923 ft., T.D.

S. Reele 2 Herndon, SE NW 22-21n-15w, pumped 45 bbl. oil, 1,603 ft., T.D.

Texas Co. 55 C.M.L., SE SE NW 23-21n-15w, pumped 88 bbl. oil and 30 bbl. water, 1,665 ft., T.D.

John Warren 2 Goodwin, SE NW 33-21n-15w, pumped 125 bbl. oil, 1,575 ft., T.D.

Little Creek, La Salle Parish: H. L. Hunt 44-F Goodpine, SW SE 32-9n-2e, 156 bbl oil and 7 bbl. water, perf. casing 2,408-12 ft., 2,705 ft., T.D.

Monroe, Morehouse Parish: Nemours Corp. 2 Tensas Delta, SW NE 21-22n-4e, 3,168,000 cu. ft. gas, 2,185 ft., T.D.

Nebo, La Salle Parish: Wissman & Sugar 1 Whatley, SW NE 24-7n-3e, dry at 4,005 ft.

Olla, La Salle Parish: Arkansas Fuel Oil 18-C Tremont, SE SE 34-10n-2e, 121 bbl. oil and 4 bbl. water, perf. casing 2,108-13 ft., 2,420 ft., T.D.

Placid Oil 113 La. Central, SW NW 11-9n-2e, dry at 2,950 ft.

Pleasant Hill, Sabine Parish: Pace Pet. 5-B Logan, SE NW 21-10n-12w, dry at 3,262 ft.

Sligo, Bossier Parish: Triangle Drilling Co. 2-C Kerr, SE NW 24-17n-12w, dry at 3,153 ft.

Waskom, Caddo Parish: Delta Drilling 1 Thigpen-Herold, old well drilled deeper, SE SW 13-17n-16w, 10,000,000 cu. ft. gas, 2,981 ft., T.D.

Zwolle, Sabine Parish: Major Oil 4 Henry, SW SW 12-7n-13w, 96 bbl. oil and 3 bbl. water, 2,557 ft., T.D.

New Wildcat Locations

Rapides Parish: M. A. Marr 1 Eota Realty Co., SW NE 14-4n-3e, deep 7,250-ft. test, set 10¾-in. at 941 ft.

Tensas Parish: Carter Oil 1 Grace M. Rhodes, NW NW 29-9n-10e, Wilcox zone test, building roads.

Macedonia Gasser Is One of Arkansas' Best Wells

The new Macedonia field in Columbia County, which was discovered only a few months ago and heretofore composed of only the discovery well, was this week given a new gas and distillate producer for the field's second well. It was McAlester Fuel Oil 1 Nipper, S½ SE 16-18-21, which made one of the best wells in all of the South Arkansas gas fields. It gaged 4,140,000 cu. ft. of sour gas daily with a distillate production of 269 bbl. in 2 hours. The production is through casing perforations from 8,935-54 ft. with total depth at 8,965 ft. The well topped the Smackover lime at 8,849 ft. and found first porosity at 8,864 ft.

Indications of a third producer for the field were seen at Magnolia 1 Franks-Norwood, 16-18-21. A drillstem test at 7,978 ft. showed 5½ stands of distillate and 550 lb. of working pressure in 12 minutes. It will be deepened into the zone before finally gaged.

Completions Increased for This Week

Completions in the South Arkansas fields showed the greatest number the past week of any similar period for several months. There were a total of 14 finaled tests as compared to a weekly average of about three for the past several months. Of this number, three were dry wildcats, four were dry field tests, one was a gas well, and six were oil wells. New locations for the week in the district showed five, with one being a wildcat in Ouachita County.

ARKANSAS COMPLETIONS

Wildcats

Clark County: Coker Oil 1 Cabe, SW SW 25-10s-19w, dry at 712 ft.

Coker Oil 1 McMillan & Cane, SW NE 34-10s-19w, top

(Continued on Page 96)

Dorcheat Field's West Flank Yields Oil

The Dorcheat field, discovered in August of 1939 by Atlantic Refining Co. and heretofore classed as mainly a gas and distillate producing field, has yielded commercial oil on the extreme west flank of the structure. Some oil was produced in the gas field prior to this completion, however, the possibly productive oil zone was known to be only 22 ft. thick and the gas pay was from 78 to 80 ft. thick, with the gas-oil contact lying at 8,633 ft., subsea.

The new oil well is Arkansas Fuel Oil 1 Barton, NW SE 14-18s-22w, and was completed for 185 bbl. of oil from pay at 8,900-10 ft., total depth, in the Reynolds lime at the top of the Smackover section. The further development of oil production in the field is, of course, a desired feature, however, it tends to limit this area as a gas field of the proportions first expected. The construction of large-scale desulfurization plants in the South Arkansas fields to process the sour gas and the locating of several large defense industries in the area were all based on the potential gas reserves of the several fields in the district. This further oil production does not necessarily darken the prospects for a sufficient supply of commercially useful gas, but does indicate that part of the structure heretofore thought to be productive of gas will probably prove to be oil bearing. The McKamie, Macedonia, Big Creek and Patton fields, together with the gas produced in conjunction with oil at Magnolia, Atlantic, Village and Schuler, can still yield all needed gas for the district's new industries.

The Dorcheat field, though mainly a gas field, is being developed on a 40-acre spacing program as it is rated a combination oil and gas field. The presence of oil production prevents the commission by law from setting drilling units larger than 40 acres, though other gas fields in the district are given 160-acre spacing rules.

Olla, South Olla and Little Creek Could Link

Discovered in March of 1940, the Olla field of La Salle Parish is now and has been since the start of the play, the dominant Wilcox zone field in the increasingly active Central Louisiana play. Production ranges in depth from about 450 ft. below the top of the Wilcox section to 1,260 ft. below the top, or from actual depths of 2,035 to 2,790 ft. There are nine actual producing sands in the Olla field, however, all fall within the Olla group of the Wilcox series. These horizons, in their descending order, are Tremont, Kraft, upper Central, lower Central, Mitchell, Mitchell basal stray, Cruse, Goodpine, and lastly the Sills sand which is a gas-producing zone.

At the present time and after slightly more than 1½ years of development there are 181 oil wells in the Olla field and 3 gas wells. The proven area of the field now includes an estimated 9,500 acres and will undoubtedly be made as development continues. The field is not defined on any side except the extreme southwest corner where Gulf Oil Corp. drilled a 5,043-ft. failure in the SW SW SW 10-9n-2e. Drilling is very steady and usually extensions are only one location at a time since completion methods and nature of the producing zone make conditions extremely hazardous if an outpost is drilled without knowing the subsurface conditions of the intervening area. Hunt Oil Co., Placid Oil Co., Arkansas Fuel Oil Co., and Carter Oil Co. are the main producers and lease holders in the field as well as in the surrounding area.

Just 3 miles south of the south end of the Olla field is the original discovery area for the sector. It is now called, after very little development during the past 2 years, the South Olla field. This field is composed of the original gas discovery well and four oil wells. The gas producer is about 1 mile south of the four oil wells, while there is one producer which is a mile out-

(Continued on Page 93)

Apache Outpost Opens New Zone in Second Wilcox Sand

By ROBERT INGRAM

A SECOND producing horizon was proved at Apache, Caddo County, and the limits of the pool were extended nearly ½ mile to the north last week at the Texas Co. 4 Smith, NE NW NW 2-5-12w. The new zone was the second Wilcox sand, topped at 3,639 ft. Production from the pool's three other wells comes from the first Wilcox sand, topped in the discovery well at 3,391 ft., about 250 ft. higher than at the 4 Smith.

The outpost brought in last week flowed 540 bbl. of oil through 1-in. choke the first 4 hours and gas gaged 1,250,000 cu. ft. a day. On the fifth hour, the well was opened through casing and did 290 bbl. of oil. It then was pinched to average 19 to 20 bbl. an hour. The well was drilled to a total depth of 3,763 ft., casing was set on top of the second Wilcox at 3,639 ft. and tubing was set at 3,681 ft.

Meantime, operations reached a fast pace with new locations for the week bringing the total number of wells drilling or ready to start to 14. The pool's fifth producer was expected soon at Texas 1 Maynahonah, SW SW NE 2-5-12w, which had the Wilcox at 3,507 ft., and drilled and cored saturation to 3,582 ft. Texas Co. had nine other locations; Sinclair Prairie, which was drilling below 1,700 ft. at 2 Lewis, NE SE SW 2-5-12w, had three, and Amerada started its first test at 1 To-Who, NE NW SW 2-5-12w.

Along the Apache trend in Comanche County, near Elgin, two wells were nearing tell-tale depths. Texas 1 Gamble, SW NE SE 5-3-10w, was drilling at 4,322 ft., and Texas 1 School Land-A, SW SE NW 13-3-10w, was drilling at 5,594 ft. Northwest of Elgin, Texas 1 School Land-B, SW SW 13-4-11w, was drilling at 2,683 ft. and Denver Producing & Refining 1 Luella Hayes, NE NE SW 14-4-11w, was drilling in very hard lime below 1,880 ft.

Guthrie Townsite Test Cores Into Saturated Sand

Interest was revived last week in Harry Miller 1 Katschor, N½ NE SW 7-16-2w, wildcat on the southwestern edge of the Guthrie townsite, in Logan County, which started coring ahead at 5,847 ft. after a fishing job was completed. Core was taken to 5,849 ft. which showed very tight sand with a slight stain and good gas odor and was believed to mark the top of the second Wilcox sand. After drilling 6 ft. farther, field reports said the sand softened considerably and the test was shut down to rig up cable tools. Operators planned to drill ahead a few feet and then resume coring.

Arbuckle at Cumberland To Be Tested

Pure Oil Co. 2 Little 210, SW SE SW 34-5s-7e, discovery well of McLish sand production in the Cumberland pool of Bryan and Marshall counties, was being deepened past the McLish last week to test deeper zones. The formation to be sought was not announced, but was expected to be the Arbuckle to which the company is preparing to drill 2 Thompson-107, NE NW NE 33-5s-7e. The Little flowed 338 bbl. of oil in 16 hours through 1-in. tubing choke with casing shut in and then flowed 151 bbl. in 8 hours through casing with tubing closed, a total of 489 bbl. in the 24 hours. The 2 Thompson has been shut down for some time in the Bromide at 5,126 ft. where it failed to find commercial production and some quarters have looked for the well to be the first abandoned test in the field before it was announced it would test the Arbuckle.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	21	6,866	63,311
Wildcats	1	138	4,844
Gas wells: Fields	2	*148	11,400
Dry holes: Fields	4	.....	13,851
Wildcats	8	.....	22,599
Total	36	.....	116,005
Recompletions	7	732	.....

*Million cu. ft.

Wild Gasser Still Blowing At Chickasha Field

Attempts were made at week's end to run casing at Little Nick Oil Co. 9 Glover, NE NE 27-5-8w, wild gasser in the Chickasha field of Grady County which is believed to have opened a new producing zone. The well blew out 2 weeks ago while crews were drilling at 3,802 ft. and has been out of control ever since. M. M. Kinley of Houston, Tex., and a crew of expert well tamers, have been called in to assist in killing the well, but they were hampered in their work by heavy rains and deep mud. There were reports that the estimated 75,000,000 cu. ft. of gas was beginning to crater the hole, but as yet there has been no fire.

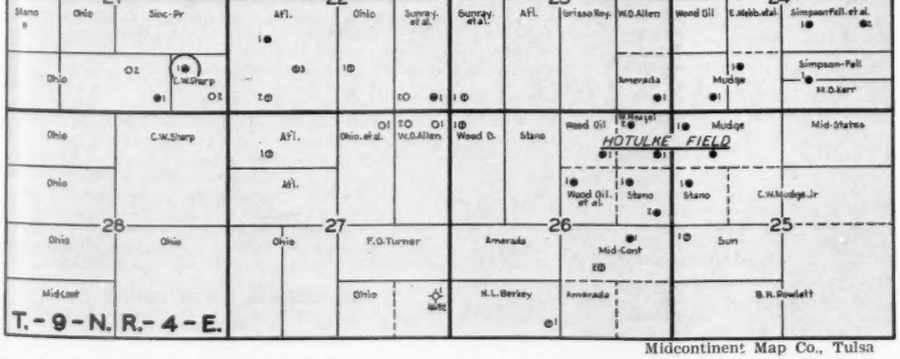
Top Price Paid at Indian Land Sale Is for Hughes County Tract

At a lease sale in Muskogee, Okla., at which the Five Civilized Tribes offered 126 tracts totaling 9,721.05 acres, Shell Oil Co., Inc., paid $4,490.40 for 80 acres comprising the E½ SE 35-9-8 in Hughes County —the highest price paid at the sale. Second high bid also was made by Shell which offered $45.07 an acre for 79.01 acres comprising Lot 2, SW NE 2-8-8. Skelly Oil Co.; Carl J. O'Hornett, Tulsa; C. W. Titus, Tulsa; Le Flore County Gas & Electric Co. of Poteau, and Eugene Jordan, Houston, Tex., were other prominent bidders.

Jordan paid $1 an acre for oil and gas leases on 565.81 acres in Grady County north of Pocasset where Homer Hurst and associates have been assembling a block for several months. Tracts awarded Jordan were in Sections 14, 15, 18, 28 and 8 of 9-7w.

Panhandle Wildcat Staked

Tentative location for the Gulf Oil Corp. wildcat, a 7,000-ft. test in Cimarron County, Oklahoma Panhandle, is in SE SE 35-2-8ecm. Acreage and royalties have had a brisk play in eastern Cimarron County for several months.



Midcontinent Map Co., Tulsa

Development of the Hotulke area of Pottawatomie County is shown here. Circled at left is the discovery well of what was first called the West Hotulke pool, but what now appears to be an extension of the Hotulke pool itself. The area is one of the most active in the state

OKLAHOMA COMPLETIONS

Wildcats

Choctaw County: Clyde Ross 1 Hardy et al, SE SE NW 21-7s-15e, dry, T.D. 1,957 ft.

Kiowa County: McBride 1-A Rhyne, NW NW SE 29-7-17w, dry, T.D. 1,265 ft., Sylvan 1,165 ft.

Jackson County: Sanders 1 Gamble, SE SE SE 12-3-21w, dry, T.D. 3,002 ft., granite wash series 1,393 ft.

Lincoln County: Mid-Continent 1 Evans Land Co., SW SE NW 31-14-6, pumped 138 bbl. oil and 216 bbl. water, Hunton 4,546-65 ft., 7-in. 4,659 ft., perf., acid, T.D. 4,844 ft., *discovery.*

Okfuskee County: Beal & Levieux 1-A Allen, NE SW NW 14-13-9, dry, T.D. 3,809 ft., Wilcox 3,790 ft.

Pottawatomie County: Vierson & Cochran 1 Blackburn, SW SW NW 3-10-4, dry, T.D. 4,448 ft., Earlsboro 4,435 ft.

Seminole County: Winona 1 Billy, SW NE NW 30-10-8, dry, T.D. 3,580 ft., Cromwell 3,558 ft.

Cummings 1 Bruner, NE NE NE 29-9-7, dry, T.D. 3,510 ft., Cromwell 3,459 ft.

Wagoner County: Dr. V. V. Grant 1 Carter, NW NW NW 31-16-19, dry, T.D. 1,060 ft.

Fields

Apache, Caddo County: Texas 3 Smith, SW SE NW 2-5-12w, flowed 208 bbl. in 1 hr., 7,000,000 cu. ft. gas, Wilcox 3,323-3,430 ft., 7-in. 3,322 ft., T.D. 3,430 ft.

Cement, Caddo County: Phillips 4 Farwell, NE NE NW 35-6-10w, gaged 25,000,000 cu. ft. gas, pay 5,236-5,496 ft., 5½-in. 5,551 ft., T.D. 6,135 ft.

Chickasha, Grady County: Little Nick 1-A Farwell, NE NE 27-5-8w, gaged 123,000,000 cu. ft. gas, pay 5,070-5,200 ft., R.P. 1,853 lb., T.D. 5,265 ft.

East Cromwell, Okfuskee County: Titus 7 Sands, SW NW SW 26-11-8, dry, T.D. 4,121 ft., Sylvan 4,120 ft.

Shell 3 Hicks, NW SW NE 35-11-8, 332 bbl., Cromwell, T.D. 3,426 ft.

Shell 5 Van Pelt, SW NE NW 35-11-8, 96 bbl., Hunton 3,952-75 ft., T.D. 4,100 ft.

West Davenport, Lincoln County: Kirk White 1 Summers, SW SE NE 5-14-5, dry, T.D. 3,540 ft., Prue 3,530 ft.

Dill, Okfuskee County: Devonian 5 Phillips-A, NW NW SW 26-12-8, pumped 22 bbl., Cromwell 3,684 ft., 7-in. 3,680 ft., T.D. 3,700 ft.

Hewitt, Carter County: Midstates Oil 15 Rexroot, SE NE SW 10-4s-2w, dry, T.D. 2,100 ft.

Merrick 9 Strowman, SE NE SE 22-4s-2w, pumped 40 bbl., pay at intervals 1,317-3,017 ft., 5½-in. 3,007 ft., T.D. 3,035 ft.

Hobart, Kiowa County: Sherman et al 7 Watkins-A, SE NW NW 20-7-17w, pumped 201 bbl. in 12 hr., pay 1,069-1,150 ft., 8⅝-in. 1,029 ft., T.D. 1,150 ft.

West Loco, Stephens County: Raizen 1 Dilly, NE SW SE 6-3s-5w, pumped 20 bbl., pay 1,175-90 ft., 6⅝-in. 1,163 ft., T.D. 1,197 ft.

Oklahoma City, Oklahoma County: Cities Service 7 Place, SW SW NE 15-11-3w, pumped 251 bbl., Wilcox 6,364 ft., 7-in. 6,364 ft., shot, T.D. 6,521 ft.

Phillips 1 Vivia, W½ SE NW 34-12-3w, pumped 517 bbl., Wilcox 6,475 ft., 8⅝-in. 6,451 ft., shot, T.D. 6,562 ft.

Oscar, Jefferson County: Long-Yingling-Hauck 32 Seay, SW SW NE 3-7s-5w, pumped 40 bbl., pay 1,253 ft., 7-in. 1,253 ft., shot, T.D. 1,280 ft.

Peck, Lincoln County: Allied Materials 2 Peck, NE SE NW 35-14-6, flowed 15 bbl. oil and 10,000,000 cu. ft. gas, dense 4,149 ft., 7-in. 4,113 ft., acid, T.D. 4,158 ft.

Rusk, Okfuskee County: Deep Rock 1 Turner, SE SE NW 7-11-8, pumped 960 bbl. oil and 23 bbl. water, Cromwell 3,710 ft., 7-in. 3,707 ft., T.D. 3,729 ft.

Sasakwa, Seminole County: Eason 2 Van Buskirk, SW SE NW 7-6-8, pumped 53 bbl., lower Calvin 1,155-64 ft., shot, 5-in. 1,154 ft., T.D. 1,170 ft.

St. Louis, Pottawatomie County: Grisso 1 Tiffin, SW SE NE 27-8-4, flowed 100 bbl. through ½-in. choke, Hunton 3,882-96 ft., acid, T.D. 3,896 ft.

Tecumseh Lake, Pottawatomie County: Hall-Jordan 3 Whitehead, NE SE SW 36-10-3, location abandoned.

East Tecumseh, Pottawatomie County: Crosbie and Atlantic 5 School land, SE SW NE 16-9-4, pumped 115 bbl., Viola 4,550 ft., T.D. 4,600 ft.

Weleetka, Okfuskee County: Smith 1 Fletcher, SE NW SE 24-10-11, pumped 10 bbl. oil and 30 bbl. water, Boch 2,007 ft., 6-in. 2,007 ft., T.D. 2,031 ft.

Northeast Wewoka, Seminole County: Davis 1 Varnum, NW SE SE 16-8-8, dry, T.D. 4,091 ft., Hunton 3,929 ft.

(Continued on Page 88)

NORTH CENTRAL TEXAS

New Caddo Lime Pool Assured For Northwestern Jack County

By D. H. STORMONT

WICHITA FALLS, Tex., Oct. 20.—A new Caddo lime pool was assured this week for the Jack County portion of the Fort Worth basin by Ed Taubert and Jesse McKee at 1 Mary Hoefle, A. James Survey. Located 12 miles northwest of Jacksboro, the wildcat had been shut down while operators repaired damage caused by fire.

At the first of the week, when swabbed, the well kicked off and flowed oil into pits steadily for 1½ hours. It was then shut in and preparations are now being made to run a production gage. Casing pressure was 580 lb. and tubing pressure was 690 lb. Casing was set on top of the Caddo lime at 4,800 ft. and production was from the lime at 4,803-35 ft. Before fire delayed operations, the well had tested 40 bbl. of oil in 1 hour from this same depth.

Taubert & McKee took the wildcat over from R. A. Conkling last September after he had drilled to 3,128 ft. Sinclair Prairie has a half interest in the deepening venture.

SUMMARY OF COMPLETIONS

North Texas

	No.	Bbl.	Footage
Oil wells: Fargo	2	157	8,725
K.M.A.	5	1,647	17,558
Other fields	3	1,020	11,347
Miscellaneous pools	12	1,614	21,215
Wildcats	1	15	4,615
Dry holes: Fields	1	.....	6,100
Miscellaneous pools	9	.....	17,313
Wildcats	1	.....	6,455
Total	34	.....	93,328

West Central Texas

	No.	Bbl.	Footage
Oil wells: Fields	7	1,161	17,949
Miscellaneous pools	3	233	3,256
Gas wells: Fields	1	*3.5	2,397
Dry holes: Fields	6	.....	9,995
Wildcats	7	.....	9,147
Total	24	.....	42,744

*Million cu. ft.

The discovery is 14 miles north of the Bryson pool, which produces from the sand at 3,100 ft. It was originally scheduled to test the Mississippi zone around 5,500 ft.

As a result of the showing of 1 Hoefle, five offsets to the discovery are expected to be drilled this fall and at least two of the tests may be under way by the first of November. Offset acreage is held by Hill & Hill, Hanlon & Buchanan, R. A. Conkling and Taubert & McKee.

Show Encountered in Montague County Wildcat

The wildcat being drilled by Continental at 1 A. R. Winder, Section 4, Limestone County School Land Survey, 7 miles northwest of Bowie, showed prospects of opening another deep pool in Montague County at the end of the week. A 2-ft. saturated lime section was encountered at 6,059 ft. in the Caddo lime, topped at 6,039 ft., and operator went in to core the softening lime.

No. 1 Winder is 4 miles northwest of the wildcat discovery of Walter Gant at 1 John Turner, which was completed earlier this month. The Gant 1 Turner found production at 6,002 ft., total depth.

Meanwhile, Benson & Benson are drilling below 5,965 ft. in lime at 1 Riley, C. Ellis Survey. Traces of saturation were logged in the conglomerate at 5,860-75 ft. No. 1 Riley is 6 miles south of Bowie.

Young County Pool Extended

The Knox pool of Young County has been given another north extension well with C. A. Lupton and associates completing 2 Taylor as a one-location-east extension to 1 Taylor, which was completed 2 years ago as a wildcat to give the pool a major extension. No. 2 Taylor flowed 90 bbl. of oil in 1 hour from 4,010 ft., total depth. Location is in Section 1965, T.E.&L. Sur. One location east of the new well, Lupton has already spudded 3 Taylor.

Denton County Wildcat Rigging Up

The first wildcat operation in Denton County in several months is rigging up and H. L. Hunt plans to spud 1 T. R. Jones early next week. The wildcat, in the extreme northwestern part of the county, is contracted to 6,000 ft. It is located in the southeast quarter of the J. Thomas Survey, Abstract 1239, 12 miles northwest of the town of Krum.

NORTH CENTRAL TEXAS COMPLETIONS

Wildcats

Clay County: Superior Oil Corp. 1 A. R. Seigler, Sec. 3211, T.E.&L. Sur., top Caddo 5,770 ft., Barnett shale 6,232 ft., Chappell 6,240 ft., dry at 6,455 ft.

Young County: Kerlyn Oil Co. 1 G. O. Hazelton, Sec. 1995, T.E.&L. Sur., 15 bbl. oil and 15 bbl. water, pumping. 16-qt. shot, top Caddo 4,245 ft., pay 3,384-94 ft., T.D. 4,615 ft.

Fields

Antelope, Clay County: Shell 17-C Henderson, Sec. 2605, T.E.&L. Sur., top Caddo 5,106 ft., top Barnett shale 5,785 ft., top Chappell lime 5,930 ft., temporarily abandoned at 6,100 ft.

Coleman, Archer County: Shell 4-A W. M. Coleman, Sec. 74, Lot 3, A.T.N.C.L. Sur., 316 bbl. in 2 hr., 2-in. tubing, est. 750 bbl. daily, top Caddo 4,984 ft., top Mississippi 5,258 ft., top Ellenburger 5,751 ft., P.B. 5,684 ft., perf. casing at 5,550-60 ft., 4,000 gal. acid, T.D. 5,850 ft.

Fargo, Wilbarger County: Amerada 1-A R. E. Harrell, Sec. 37, Blk. 15, H.&T.C. Sur., 120 bbl., pumping, perf. casing 3,912-24 ft., T.D. 4,365 ft.

Amerada 1 Pauline Andrews, Sec. 57, Blk. 15, H.&T.C. Sur., 37 bbl. pumping, 4,360 ft.

Griffin, Archer County: Jack E. Kadane, Tr., 2-C E. P. Griffin, Sec. 12, Palo Pinto C.S.L. Sur., 68 bbl. in 1 hr., ¾-in. choke on 2-in. tubing, est. 250 bbl. daily, top K.M.A. lime 4,088 ft., pay 4,381-98 ft.

K.M.A., Wichita County: Hammon-Hanlon & Buchanan 49-A Fassett & Tuttle, Sec. 1, E.T.R.R. Sur., Abst. 76, 67 bbl. pumping, 614-22 ft.

Bishop Oil Co. 1 E. J. & J. Waggoner, Sec. 1, G.C. &S.F. Sur., Abst. 782, 31 bbl. in 2 hr., est. 150 bbl. daily, perf. casing 3,694-3,711 ft., 4,000 gal. acid, 25-qt. shot 3,868-96 ft., T.D. 3,896 ft.

Fain-McGaha Oil Corp. 9-B E. P. Griffin, Sec. 3, W. H. Spillers Sur., Abst. 257, 259 bbl. in 3 hr., ¾-in. choke on 2-in. tubing, est. 750 bbl., top K.M.A. lime 3,646 ft., top Ellenburger 4,262 ft., pay 4,262-72 ft.

Blanco Oil Co.-Hanlon & Buchanan 9 Fred Thom, W. H. Spillers Sur., Abst. 257, 90 bbl. in 2 hr., ¾-in. choke on 2-in. tubing, est. 490 bbl. daily, top K.M.A. lime 3,765 ft., top Ellenburger 4,310 ft., 1,500 gal. acid, pay 4,320-88 ft.

Iowa Pavne Oil 3 Fred Thom, W. H. Spillers Sur., Abst. 257, 74 bbl. in 3 hr., ⅝-in. choke on 2-in. tubing, est. 190 bbl. daily, top K.M.A. 3,750 ft., top Ellenburger 4,318 ft., 2,000 gal. acid, pay 4,384-90 ft.

T.C.U., Cooke County: E W. Mudge, Jr., 6 C. J. Fette, Charles Carter Sur., Abst. 1190, 20 bbl. pumping, 1,089-99 ft.

Miscellaneous Pools

Baylor County: Edward C. Lawson 1 F. C. Green, Sec. 217, T.&N.N. Ry. Sur., Abst. 362, dry at 3,082-3,220 ft.

Clay County: Staley Oil Co. 3 E. H. Hamilton, Byers Bros. subd., Blk. 83, 75 bbl. pumping, 1,116-31 ft.

Sussex Oil Co. 10 E. H. Hamilton, Byers Bros. subd., Blk. 38, 55 bbl. pumping, 1,122-32 ft.

George G. Golden 8-C First Texas Joint Stock Land Bank, Sec. 13, Thornberry subd., 70 bbl. pumping, 1,115-28 ft.

Stavton Oil Co. 21 W. M. McGregor, Sec. 52, Specht-McCutchen Sur., 30 bbl. pumping, 1,172-84 ft.

Shell Oil Co. 15 A. Colburn, Sec. 2606, T.E.&L. Co. Sur., dry 921 ft.

Cooke County: Richards & Bohner 2 H. Fleitman, J. Clark Sur., Abst. 194, dry 822 ft.

Jack County: Harper & Knappenburger 6 O. Loving, Sec. 3345, T.E.&L. Sur., top Palo Pinto 1,514 ft., dry. 3,324 ft.

Wichita County: Richard Kohlman 6 Foster & Allen, 2 bbl. pumping, 320-25 ft., P.B. from 631 ft.

Akin, Dimock & Costley 1-A Edna Oates, R. Brown Sur., Abst. 519, abandoned location.

Akin, Dimock & Costley 1-AA Edna Oates, R. Brown Sur., Abst. 519, dry at 1,316 ft.

W. E. Production Co. 2 J. W. Murphy, Sec. 3, W. H. Anderson Sur., Abst. 1, dry at 1,385 ft.

D. A. Kahn 1 J. E. Roller estate, C.T.R.R. Sur., Block 3, Abst. 50, dry at 291 ft.

W. H. Hammon 8 Nellie M. Johnson, H. Hastie Sur., Abst. 92, 16 bbl. pumping, 5-qt. shot 1,299-1,306 ft., T.D. 1,314 ft.

J. D. Anderson et al 1 Jennie Jenne, Sec. 1, H Hastie Sur., Abst. 98, dry at 1,352 ft.

Hanlon & Buchanan 7-A T. L. Burnett, Sec. 34, H.& G.N. Sur., Abst 435, 9 bbl. pumping, 5-qt. shot 706-27 ft.

Wilbarger County: Phillips 10 W. T. Waggoner, Sec. 43, Blk. 4, H.&T.C. Sur., 94 bbl. in 3 hr., ¾-in. choke on 2-in. tubing, est. 150 bbl. daily, top Ellenburger 3,804 ft., 1,000 gal. acid, 3,805-15 ft.

Paradise Oil Co. 6-A W. T. Waggoner, Sec. 45, Blk. 4, H.&T.C. Sur., 10 bbl. pumping, 10-qt. shot 1,885-91 ft.

Paradise Oil Co. 7 W. T. Waggoner, Sec. 45, Blk. 4, H.&T.C. Sur., 75 bbl. in 3 hr., ½-in. choke on 2-in. tubing, est. 290 bbl. daily, top Ellenburger 3,738 ft., perf. casing 3,008-16 ft., 1,000 gal. acid, T.D 3,818 ft.

Young County: Pemeta Oil Co. 6-B A. E. Robinson, 8 bbl., 668-74 ft.

Leslie C. Lawler 3 Henry Schlittler, R. E. Lamar Sur., Abst. 1840, 500 bbl. in 6 hr., open 2-in., est. 900 bbl. daily, 3,743-70 ft.

Tolbert, Karrenbrock & Wells 1 Leona McCluskey, J. T. Mullinox Sur., Abst. 2,044, top Caddo 3,391 ft., Mississippi 4,576 ft., dry at 4,682 ft.

NORTH TEXAS FIRST REPORTS

Baylor County: Tom F. Hunter 1 Robertson, CSL, 4,590 ft. from N and 460 ft. from E lines of Robertson CSL Sur. Abst. A-280, 3,500-ft. test.

Denton County: Hunt Oil Co. 1 T. J. Jones, 4,300 ft. from S and 671 ft. from E lines of J. Thomas Sur., Abst. 1239, Ellenburger test.

Foard County: B. Sullivan 1 McCoy, 467 ft. from N and W lines of farm in J. M. Seaton Sur., 6,000-ft. test, rigging up rotary.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Oct. 20.—Operators are going into the third week of testing at Coleman County's newest discovery, Merry Brothers & Perini 1 C. M. Greer. Experimenting with various chokes, operators continued testing after cleaning out with reverse circulation.

No. 1 Greer made as high as 33 bbl. per hour on initial tests through open 6-in. casing. At last reports, the well flowed 7 bbl. hourly at the beginning of a 12-hour gage and increased the flow to 10 bbl. per hour at the end. Flow was through tubing and an increase in gas was noted. Production is from the Gray sand at 3,909-37 ft., total depth. At the end of the week a new separator was being installed.

Location of 1 Greer is in Subdivision 2, H. Kegans Survey 520.

A second offset to the new discovery was added this week, with Anderson-Prichard staking location for 1 Bettie Matthews in the northwest corner of a 67-acre tract in the H. Kegans Survey 520. The test is a south offset to 1 Greer and is contracted to 4,000 ft.

Shackelford-Stephens County-Line Activity

The wildcat drilled by C. Andrade at 1 Walls Pasture last summer has been sold to the Lone Star Gas Co. for further testing. The well has been treated with 500 gal. of acid and at the end of the week, operator was cleaning out. No. 1 Walls Pasture was completed in the Ranger lime at 4,070-80 ft. for 1,085,000 cu. ft. of wet gas daily, with a spray of distillate.

The well is in the northeast 40-acre tract of Section 13, O.A.L. Survey, and is located nearly 1 mile west of the Loving pool, which produces from the Caddo lime at 3,500 ft. In drilling, 1 Walls Pasture failed to find any shows in the Caddo lime.

Three Wildcats Staked

Haskell County gained another wildcat this week. Joe E. Worsham will drill a 3,200-ft. rotary wildcat test on the 370-acre farm of G. McLennon. Exact footage has been announced as 440 ft. from the south and west lines of the farm in the S. C. Robertson Survey, Abstract 352. Worsham and others have blocked up considerable acreage in the area and plan actual drilling operations within the next few weeks.

In Coleman County, Albert W. Adkisson has staked a new wildcat as 1 B. A. Barton. The wildcat is located in the southwest corner of a 240-acre lease in Block 229, William Farris Survey. It will be drilled with cable tools and is 10 miles south of Santa Anna.

The deepest wildcat ever drilled in Hamilton County is scheduled for spudding within the next few days. Grady Wallace has staked 1 J. H. Robertson, 9 miles west of the town of Hamilton on the 27-acre farm in the John Chew Survey. No. 2 Robertson is contracted to 5,000 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: J. D. Kynaston et al 1 Eula M. Scale, J. H. Brown Sur. 254, dry at 1,262 ft.

Concho County: Nixon & Abernathy 1 J. W. Riley, Sec. 1705, C. C. F. Blanchard Sur., Abst. 1225, dry 112 ft.

(Continued on Page 82)

FOR THE WANT OF A NAIL...

...The Battle was Lost

IN THE slender thread of tremendous trifles may rest the difference between life and death, success or failure, happiness or sorrow. Legendary is the tale of a battle lost for the want of a nail. History tells how a tiny lad's sturdy arm thrust into a hole in a dike saved Holland.

In 1941 heroic but humble tasks are being accomplished every day by individuals and organizations whose self-effacement frequently prevents public recognition.

In the Texas sun a sprawling refinery is building. Day and night the hum of machinery and the shouts of sweating men fill the soft summer air. From this refinery runs a six-inch pipeline to Seaboard, 800 miles away. Beside it stands a trim and sturdy cooling tower, the redwood frame of which once grew in a California forest. All are monuments to Fluor's construction and engineering policy of "from plan to plant with undivided responsibility."

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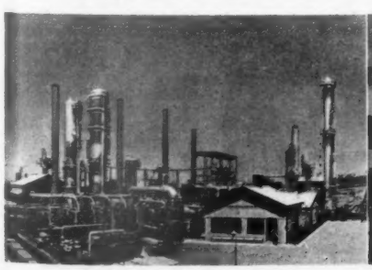
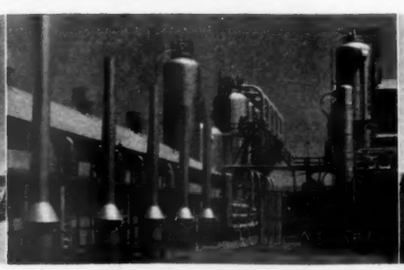
Since its inception, The Fluor Corporation Ltd. has consistently and conservatively applied methods and men to the task of designing, engineering and constructing plants and products that would contribute to the steady progress of the industries it serves. In addition to maintaining a complete designing, engineering and construction service, Fluor also designs, manufactures and erects a

complete line of Atmospheric Aerator Type and Mechanical Draft Cooling Towers. Measurable operating and maintenance economies have been effected for the companies that have selected the engineering and construction services and the products of this organization. The Fluor Corporation is prepared to serve and assist you through its competent personnel in offices located from coast to coast.

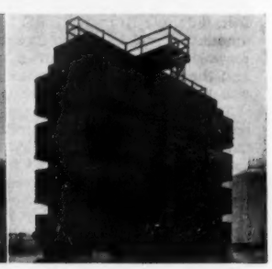


Partial view of an extensive Pacific Coast Cracking Plant, constructed by Fluor.



Propane Dewaxing Plant in refinery of major oil company, constructed by Fluor.

Fluor Forced Draft Cooling Tower constructed for a Mid-Continent oil company.



Fluor Atmospheric Cooling Tower in use in a large chemical plant.

Reprinted from Fortune, August, 1941

McClosky Pool in Prospect South of Johnsonville

By STAFF CORRESPONDENT

MATTOON, Ill., Oct. 20.—Illinois may gain three new oil pools in the next few days as a result of wildcat exploration during the past week. Also of considerable interest were two deep tests being drilled by the Carter Oil Co. in the Louden field.

Most promising of the wildcat ventures was Bell Brothers 1 Fuhrer, W½ NE NW 33-1s-6e. No. 1 Fuhrer, 6 miles south of production in the Johnsonville pool, encountered saturation in both the Aux Vases and the McClosky and is being completed in the latter formation. McClosky saturation was encountered at 3,156-60½ ft. and casing was cemented at 3,151 ft. The Aux Vases sand at 3,020-40 ft. showed 100 ft. of oil and 90 ft. of oil-cut mud during a 30-minute drill-stem test. Total depth of the well is 3,170 ft.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Benton	5	1,058	10,675
Clay City	3	263	9,208
Dale	3	630	9,243
Dundas	5	962	14,227
Johnsonville	15	17,506	48,008
Louden	3	750	9,146
Mount Carmel	4	322	7,480
New Harmony	5	356	13,907
Woodlawn	6	2,320	11,815
Other pools	18	4,680	45,285
Wildcats	1	41	1,891
Gas wells: Westfield	1	*0.01	304
Dry holes: Fields	†3	.....	9,334
Wildcats	17	.....	42,835
Total	89	.....	233,358
Salt-water disposal well	1	.....	955
Recompletions	3	290	.....

*Million cu. ft.
†Boyleston 1, Johnsonville 1, Roland 1.

Two Richland County Wildcats May Open New Pools

Ohio Oil Co.'s Richland County wildcat, 2 miles north of the Parkersburg field, 1 Lambert, S½ SE NW 17-2n-14w, flowed 174 bbl. of fluid in 14 hours after a 2,500-gal. acid treatment of McClosky pay at 3,137-49 ft. The well made 9 per cent water. Ohio's test, however, does not mean an extension of the Parkersburg field since a dry hole, Ohio 1 M. Walden, S½ NW SW 20-2n-14w, was drilled midway between the field and 1 Lambert.

The other prospective pool opener is Nolf et al 1 Nuding, W½ SW NW 6-4n-14w, 4 miles from the Olney field. Oil rose 1,100 ft. in the hole at 1 Nuding when McClosky saturation was encountered. The operators have started their second test, 1 Sterchi heirs, to the north of 1 Nuding.

Louden Devonian Production Extended Northeast

Another important development of the week was a show of oil in the Trenton lime in the Carter Oil Co.'s deep test in the Louden field of Fayette County. The test, 6 Jennie Brauer, SE SE 21-8n-3e, produced a small amount of oil from the Trenton at 4,051 ft. but the formation was not believed commercially productive and the well is drilling on to the St. Peter sand. This will be the first St. Peter test in the county.

The Devonian production in the Louden pool apparently will be extended 2 miles to the northeast by Carter 3-D Nellie Wetmore, SW NW 11-8n-3e, now being completed. The oil obtained from this well is of much higher quality than that produced in other Devonian wells in the Louden field and geologists believe it possible that two separate Devonian pools exist in the field.

Townsite Development in Prospect for Grayville

Townsite drilling in Grayville was again considered a possibility within a short time, with the prospect of production at First National Petroleum Trust 1 Reeves, wildcat less than a mile southwest of the city limits. The new test, located in E½ SE NW SW 20-3s-14w, is reported cleaning out in 15 ft. of Palestine saturation encountered below 2,316 ft.

A previous test adjacent to Grayville on the northwest was abandoned last week, dispelling prospects of townsite drilling in that part of the city. Leases were being sold on lots in the southwest part of Grayville several days ago.

Renewed Oil Activity Predicted For Old Wamac Pool

Timberlake et al 1 Watts, SW 19-1n-1e, Petro sand test in the old Wamac pool, assured a revival of activity in the pool when it produced 84 bbl. of oil during a 24-hour test of a supposedly drained formation. No. 1 Watts was drilled to the Petro (Pennsylvanian) sand, topping pay at 733 ft. Casing was set at 725 ft. and the well was given a 50-qt. shot.

Oil men were generally surprised at the production of the well since most of them were of the opinion that sand was drained. The Petro sand was the center of much activity 18 years ago and wells drilled in the formation are still producing.

Operators of 1 Watts have now moved a short distance to the west and are spudding another Petro test. The new location is 1 Timmons, SE SW 19-1n-1e.

ILLINOIS COMPLETIONS

Wildcats

Clay County: B. F. Williams 2 Keck, SE NE SW 35-4n-7e, dry at 3,123 ft., Kincaid 1,988 ft., Menard 2,193 ft., Tar Springs 2,310 ft., Glen Dean 2,390 ft., Golconda 2,455 ft., Barlow 2,553 ft., Weller 2,598 ft., Benoist 2,768 ft., fair show oil, Aux Vases 2,842 ft., show oil, Ste. Genevieve 2,909 ft.

Clinton County: Lilly et al 1 Kuhn, NE SE NE 22-1n-1w, dry at 1,146 ft., Glen Dean 1,144 ft.

Coles County: W. Thomas 2 S. P. Taylor, E½ E½ SW NE 33-14n-10e, dry at 245 ft.

Edwards County: H. K. Riddle 1 M. K. Tarfs, S½ SW NW SW 17-3s-14w, dry at 3,169 ft., Menard 2,234 ft., Waltersburg 2,306 ft., Waltersburg sand 2,325 ft., Tar Springs 2,417 ft., Glen Dean 2,504 ft., Hardinsburg 2,551 ft., Golconda 2,598 ft., Benoist 2,902 ft., Renault 2,941 ft., Aux Vases 3,001 ft., Ste. Genevieve 3,020 ft.

Fayette County: Luttrell 1 Ford, NE NE NW 31-5n-3e, pumped 41 bbl. oil and 37 bbl. water, 5-qt. shot 1,887-91 ft., casing collapsed, Benoist sand 1,884-91 ft., T.D. 1,891 ft.

Franklin County: Daly 1 Collins, NE NE SW 34-7s-2e, dry at 2,827 ft., Rosiclare 2,758 ft., Fredonia 2,789 ft.

Texas 2 J. Bond, N½ NW NE 34-6s-6e, dry at 3,126 ft., Glen Dean 2,490 ft., Hardinsburg 2,540 ft., Golconda 2,620 ft., Barlow 2,745 ft., Cypress sand 2,780 ft., Benoist 2,975 ft., Cypress 2,780 ft., Benoist 2,975 ft., Renault 2,990 ft., Aux Vases 3,078 ft., T.D. 3,120 ft.

Gallatin County: Sinclair 1 Schmith, SE SE SW 21-8s-9e, dry at 2,970 ft., Tar Springs 2,155 ft., Glen Dean 2,250 ft., Hardinsburg 2,305 ft., Golconda 2,381 ft., Barlow 2,490 ft., Aux Vases 2,798 ft., Ste. Genevieve 2,830 ft., McClosky 2,880 ft.

Delta Drlg. 1 Minier, NE NE NW 28-8s-9e, dry at 2,993 ft., Glen Dean 2,245 ft., Golconda 2,356 ft., Barlow 2,500 ft., Cypress sand 2,523 ft., Paint Creek 2,593 ft., Renault 2,641 ft., Aux Vases 2,695 ft., Rosiclare 2,792 ft., Fredonia 2,826 ft., McClosky 2,833 ft.

Delta Drlg. 1 Hise, SW SW SE 21-8s-9e, location abandoned.

Duncan et al 1 Blair, SE SE 20-8s-10e, dry at 2,940 ft., Golconda 2,216 ft., Barlow 2,429 ft., Benoist 2,571 ft., Renault 2,656 ft., Aux Vases 2,750 ft., Ste. Genevieve 2,762 ft., St. Louis 2,936 ft.

Jasper County: Schulman Bros. 1 Prudential Life, S½ NW SE 6-6n-10e, dry at 2,888 ft., Glen Dean 2,343 ft., Golconda 2,406 ft., Ste. Genevieve 2,806 ft., Fredonia 2,840 ft., McClosky 2,868 ft.

Jefferson County: H. Luttrell et al 1 Mooney, SW NW SW 15-1s-2e, dry at 2,207 ft., Glen Dean 1,573 ft., Hardinsburg sand 1,634 ft., Golconda 1,670 ft., Barlow 1,775 ft., Cypress sand 1,795 ft., Benoist 1,936 ft., Renault 1,999 ft., Aux Vases 2,030 ft., Ste. Genevieve 2,078 ft., Rosiclare 2,096 ft., McClosky 2,158 ft.

Richland County: Ohio 1 M. T. Walden, S½ NW SW 20-2n-14w, dry at 3,203 ft., Glen Dean 2,592 ft., Hardinsburg 2,622 ft., Golconda 2,685 ft., Barlow 2,778 ft., Paint Creek 2,894 ft., Benoist 3,016 ft., Renault 3,047 ft., Aux Vases 3,090 ft., Ste. Genevieve 3,117 ft., McClosky 3,154 ft.

Richey et al 1 Richey, E½ SE SW 23-4n-14w, dry at 3,073 ft., Ste. Genevieve 2,905 ft., Rosiclare 2,992 ft., Fredonia 2,928 ft., McClosky 3,015 ft., St. Louis 3,058 ft.

St. Clair County: G. Morris 1-A V. Rasp, NW NW SW 32-2n-7w, dry at 2,075 ft.

Shelby County: Wiser Oil 1 W. B. Smith, SW SE NW 5-10n-3e, dry at 1,800 ft., Glen Dean 1,441 ft.

Wabash County: Hayes Drlg. 1 Kieffer, NE NE SE 35-1n-13w, location abandoned.

Washington County: H. L. Whitaker et al 1 Garnholz, SW SE SW 24-1s-2w, dry at 1,566 ft., Barlow 1,354 ft., Cypress sand 1,422 ft., Paint Creek 1,468 ft., Benoist 1,542 ft., Benoist sand 1,552 ft.

White County: Smokey Oil 1 L. R. Ford et al, SW NW NW 30-5s-11e, location abandoned.

Papoose 1 Driscoll, W½ SW SE 18-5s-8e, dry at 3,584 ft.

Fields

Allendale, Wabash County: Snowden-McSweeney 2 Cozine, SW NW NE 16-1n-12w, pumped 100 bbl., 10-qt. shot 1,989-2,000 ft., Cypress sand 1,989-2,000 ft., T.D. 2,292 ft., P.B. 2,001 ft.

J. S. Young 2-A P. Barney, N½ SE SE NW 1-1n-12w, pumped 40 bbl., 40-qt. shot 2,030-45 ft., Benoist 2,029 ft., T.D. 2,050 ft.

Benton, Franklin County: Shell 16 C. W. & F. "R-S," SE SW NW 36-6s-2e, pumped 286 bbl., 15-qt. shot 2,108-23 ft., 15-qt. shot 2,132-47 ft., Tar Springs 2,072-94 ft., 2,094-2,122 ft., T.D. 2,147 ft.

Adkins 5 Lager, SE SE NE 35-6s-2e, pumped 137 bbl., 60-qt. shot 2,125-54 ft., reshot 90-qt. 2,125-54 ft., Tar Springs 2,112 ft., T.D. 2,165 ft.

Wegener 3 Hammond, S½ NE NE NE 26-6s-2e, pumped 250 bbl., 60-qt. shot 2,093-2,116 ft., Tar Springs 2,083 ft., T.D. 2,116 ft.

J. Menhall 3 Moseley, SE NE NE 26-6s-2e, pumped 210 bbl., 30-qt. shot 2,115-26 ft., Tar Springs 2,106 ft., T.D. 2,126 ft.

Gillim 1 Smith, SW SE NE 23-6s-2e, pumped 175 bbl., 40-qt. shot 2,108-21 ft., Tar Springs 2,100 ft., T.D. 2,121 ft.

Smokey Oil 2 Crawford, NE NW NE 23-6s-2e, location abandoned.

Bonpas, Richland County: Case-Pomeroy 1 A. E. Bunn, S½ SE SW 34-3n-14w, pumped 80 bbl. oil and 200 bbl. water, perf. 3,134-36 ft., 3,127-32½ ft., squeezed, reperf. 3,125-31 ft., 5,000 gal. acid, McClosky 3,128-35 ft., T.D. 3,212 ft.

Boyleston, Wayne County: Holskuh & Murphy 1 Sprague, SE NE SE 4-2s-7e, dry at 3,110 ft., Glen Dean 2,566 ft., Golconda 2,646 ft., Barlow 2,755 ft., Cypress 2,798 ft., Renault 3,073 ft., Aux Vases 3,080 ft.

Bridgeport, Lawrence County: New Deal Oil 1 Clark, W½ E½ SE SW 2-2n-12w, pumped 19 bbl., 30-qt. shot 750-67 ft., 45-qt. shot 750-67 ft., sand 750-67 ft., T.D. 767½ ft.

Clay City, Clay County: Pure 3 J. M. Bissey, E½ NW NE 18-2n-8e, pumped 21 bbl. oil and 36 bbl. water, McClosky 2,993-3,002 ft., 3,008-10 ft., 3,045-65 ft., 3,075-78 ft., 3,088-95 ft., T.D. 3,100 ft.

Clay City, Wayne County: Pure 1-B E. Obrecht, N½ NW NW 22-2n-8e, pumped 35 bbl. oil and 5 bbl. water, perf. 2,653-75 ft., Cypress sand 2,662-77 ft., T.D. 3,055 ft., P.B. 2,989 ft.

Pure 1-A S. B. Garrison, W½ NE NE 1-1n-7e, flowed 207 bbl., 5,000 gal. acid, McClosky 3,046-50 ft., T.D. 3,053 ft.

Cordes, Washington County: Shell 1 Sharkawski, NW SW SW 14-3s-3w, salt-water-disposal well, 25-qt. shot 820-45 ft., Tar Springs 784-86 ft., T.D. 955 ft., P.B. 901 ft.

Dale, Hamilton County: Shell 6 N. J. Beagle, SE SW SE 6-6s-7e, flowed 97 bbl., 15-qt. shot 2,960-75 ft., Aux Vases sand 2,954-76 ft., T.D. 2,990 ft.

Reward 2 Anderson, SE SW SW 12-6s-6e, swabbed and flowed 308 bbl., Aux Vases 3,112 ft., pay 3,121-44 ft., T.D. 3,147 ft.

Politis et al 1 Mayberry, pumped 225 bbl. oil and 25 bbl. water, 20-qt. shot on bottom, Aux Vases 3,090 ft., T.D. 3,110½ ft., P.B. 3,106 ft.

Dundas, Jasper County: Pure 2 J. W. Trainor, W½ NE SE 8-5n-10e, flowed 99 bbl., 5,000 gal. acid, McClosky 2,775-77 ft., 2,782-90 ft., 2,800-10 ft., T.D. 2,815 ft.

Pure 3 J. W. McCormack, W½ SE SE 19-5n-10e, flowed 199 bbl., 5,000 gal. acid, McClosky 2,812-20 ft., T.D. 2,844 ft.

Texas 1 E. E. Hines A, E½ SE SW SW 4-5n-10e, flowed 70 bbl., 3,000 gal. acid, McClosky 2,794 ft., T.D. 2,893 ft.

Pure 2 O. J. Berghouser A, NW SW SE 5-6n-10e, pumped 144 bbl., 5,000 gal. acid, McClosky 2,758-60 ft., 2,770-74 ft., T.D. 2,800 ft.

Dundas, Richland County: Pure 1 J. H. Wachtel B, N½ NW NW 32-5n-10e, flowed 450 bbl., 5,000 gal. acid, McClosky 2,845-54 ft., T.D. 2,875 ft.

Fairfield, Wayne County: Watkins & Weinert 1 Brach, E½ SW NW 36-1s-7e, pumped 156 bbl. oil and 20 bbl. water, 3,000 gal. acid, McClosky 3,346-54 ft., T.D. 3,356 ft.

Griffin, Wabash County: Longhorn 20 Helm, SE NW SE 22-3s-14w, pumped 100 bbl., 40-qt. shot on bottom, Tar Springs 2,161 ft., T.D. 2,173 ft.

W. W. Grav 16 fee A, NE SW NW 14-3s-14w, pumped 125 bbl., natural, Cypress sand 2,529-32 ft., T.D. 2,532 ft.

Hoodville, Hamilton County: Texas 2 K. Edwards, NE SE NW 11-6s-6e, flowed 142 bbl., natural, Aux Vases 3,047-57 ft., T.D. 3,057 ft.

Ohio 3 R. E. Grimes, SW NW NW 2-6s-6e, location abandoned.

Iron, White County: Sinclair-Ohio 16 Rudolph, SW NE SW 12-6s-9e, swabbed 77 bbl. oil and 25 bbl. water, 5-qt. shot 2,280-83 ft., Waltersburg sand 2,273 ft., T.D. 2,285 ft.

Johnsonville, Wayne County: Wiser 3 Dickey B, S½ SE SW 34-1n-6e, pumped 187 bbl., perf. 3,090-93 ft., 3,130-53 ft., 3,180-88 ft., 3,192-96 ft., 5,000 gal. acid, McClosky 3,130-53 ft., 3,180-88 ft., 3,192-96 ft., T.D. 3,254 ft.

Ohio 1 N. B. Wels, N½ NW NE 35-1n-6e, flowed 2,068

bbl., 4,000 gal. acid, McClosky 3,125-34 ft., 3,140-48 ft., T.D. 3,150 ft.

United Prod. 6 L. Hale, S½ SE NW 33-1n-6e, dry at 3,284 ft., Glen Dean 2,592 ft., Golconda 2,693 ft., Cypress 2,798 ft., Aux Vases 3,063 ft., slight show oil 3,070-76 ft., Ste. Genevieve 3,124 ft., show oil 3,137-40 ft., Fredonia 3,197 ft.

Olson 1 Eikelberry, W½ SE NE 1-1s-6e, pumped 5½ bbl. oil and 35 bbl. water in 18 hr., pumped off, perf. 3,226-37 ft., 1,500 gal. acid, McClosky 3,227-32 ft., T.D. 3,265 ft.

Olson Drlg. 1 Hopkins-Oglesby,, W½ NE NW 3-1s-6e, flowed 956 bbl., 5,000 gal. acid, McClosky 3,147-54 ft., 3,163-65 ft., 3,187-3,204 ft., T.D. 3,218 ft.

Texas 2 Brimberry, SW NW SE 22-1n-6e, flowed 1,850 bbl., natural, McClosky 3,173 ft., T.D. 3,205 ft.

R. O. Smith 1 Greathouse, N½ SW SE 22-1n-6e, flowed 3,443 bbl., 5,000 gal. acid, McClosky 3,145-54 ft., 3,161-64 ft., T.D. 3,182 ft.

Shell 1 G. A. Wilson, S½ SE NE 33-1n-6e, flowed 3,389 bbl., 5,000 gal. acid, McClosky 3,117-25 ft., 3,132-36 ft., 3,174-88 ft., T.D. 3,206 ft.

Wiser 4 J. H. Matchett, W½ SW SW 23-1n-6e, flowed 991 bbl. in 12 hr., perf. 3,165-75 ft., 3,184-94 ft., McClosky 3,165-75 ft., 3,184-94 ft., T.D. 3,202 ft.

Ohio 1 Leathers, S½ SE SW 26-1n-6e, flowed 528 bbl., 2,500 gal. acid, McClosky 3,127-32 ft., 3,135-53 ft., T.D. 3,157 ft.

Texas 6 M. Greathouse, N½ NW NE 27-1n-6e, flowed 1,560 bbl., natural, McClosky 3,099-3,102 ft., T.D. 3,116 ft.

Texas 1 O. Shelborn, S½ NW NW 27-1n-6e, flowed 150 bbl., 6,000 gal. acid, McClosky 3,084-90 ft., 3,094-95 ft., T.D. 3,160 ft.

Texas 3 F. Schultz, S½ NE NE 28-1n-6e, flowed 774 bbl., tools still in hole, McClosky 3,110-17 ft., T.D. 3,129 ft.

United Prod. 5 L. Hale, N½ SE NW 33-1n-6e, pumped 175 bbl., McClosky 3,218-28 ft., 3,234-40 ft., T.D. 3,300 ft.

Wiser Oil 3 C. E. Lowe, N½ NW SE 33-1n-6e, flowed 1,200 bbl., 5,000 gal. acid, perf. 3,137-43 ft., 3,150-57 ft., McClosky 3,137-43 ft., 3,150-57 ft., T.D. 3,218 ft.

Wiser 2 Dickey B, N½ SW SE 34-1n-6e, pumped 229 bbl., 5,000 gal. acid, perf. 3,127-40 ft., 3,178-84 ft., 3,189-97 ft., McClosky 3,127-38 ft., 3,154-62 ft., 3,174-84 ft., 3,189-97 ft., T.D. 3,247 ft.

Louden, Fayette County: Carter 3 R. McClain, NE SE SE 32-8n-3e, pumped 78 bbl., 20-qt. shot 1,527-37 ft., milled casing 1,523-43 ft., sand 1,512-51 ft., old well worked over, T.D. 1,587 ft.

Carter 2 M. Taylor, SE SW SW 33-8n-3e, pumped 168 bbl., milled casing 1,480-1,503 ft., 25-qt. shot 1,486-96 ft., 20-qt. shot 1,579-85 ft., Cypress sand 1,478-1,506 ft., old well worked over, T.D. 1,585 ft.

Carter 3-D M. Tucker, SW NE 28-8n-3e, flowed 250 bbl., 100 gal. acid, Devonian 2,997 ft., pay 3,073 ft., T.D. 3,081 ft.

Carter 4-D N. Logan, NW SW 22-8n-3e, flowed 250 bbl., 100 gal. acid, Devonian 2,954 ft., pay 3,038 ft., T.D. 3,041 ft.

Carter 3-D H. Beck, SE SW 21-8n-3e, flowed 250 bbl., Devonian 2,938 ft., pay 3,022 ft., T.D. 3,024 ft.

Mount Carmel, Wabash County: Seaboard et al 1 Clint Ginsewife, NW NE NW 21-1s-12w, pumped 107 bbl., 40-qt. shot 1,986-97 ft., Cypress sand 1,976-97 ft., T.D. 1,997½ ft.

William Bailor 1 Morgan, SE SE NW 21-1s-12w, pumped 15 bbl., 45-qt. shot 1,461-83 ft., Biehl 1,463-83 ft., T.D. 1,485 ft.

William Bailor 7 Friend, SW SE NW 21-1s-12w, pumped 150 bbl., 25-qt. shot 1,981-97 ft., Cypress sand 1,979-95 ft., T.D. 1,997 ft.

William Bailor 6 Friend, E½ NW NE SW 21-1s-12w, pumped 50 bbl., 50-qt. shot 1,989-2,000 ft., Cypress sand 1,980-2,000 ft., T.D. 2,000 ft.

New Harmony, White County: Sun 36 Greathouse, NW SE SE 33-4s-14w, pumped 200 bbl., 120-qt. shot 2,671-2,719 ft., Benoist 2,672 ft., T.D. 2,720 ft.

Mabee Drlg. 2 F. M. Hon C, W½ SW SW NE 9-4s-14w, pumped 25 bbl., 50-qt. shot 2,631-43 ft., Cypress sand 2,623-43 ft., T.D. 2,656 ft., P.B. 2,653 ft.

J. P. Washburn 1 E. S. Dennis, NE NE NW NW 20-4s-14w, pumped 34 bbl. oil and 25 bbl. water, perf. 2,777-95 ft., 20-qt. shot 2,785-95 ft., Cypress sand 2,729 ft., T.D. 3,008 ft., P.B. 2,852 ft.

Sun 5 E. S. Jacobs B, NE NE SE 29-4s-14w, pumped 62 bbl. oil and 15 bbl. water, 30-qt. shot 2,739-49 ft., Benoist 2,705-15 ft., 2,739-51 ft., T.D. 2,751 ft.

Sun and Ellis 11 Jacobs A, S½ SE NW 28-4s-14w, location abandoned.

Sun and Ellis 14 Jacobs A, NE SW NE 28-4s-14w, location abandoned.

First Nat. Pet. Trust 7 Hon, NW NE SE 32-3s-14w, pumped 35 bbl., 50-qt. shot 2,732-55 ft., Benoist sand 2,749-58 ft., T.D. 2,772 ft., P.B. 2,759 ft.

New Haven, White County: Sinclair 3 G. M. Boetticher, NW NE SW 19-7s-11e, pumped 44 bbl. in 11 hr., 1,000 gal. acid, reacidized 2,000 gal., McClosky 2,814-17 ft., 2,835-37 ft., old well deepened from 2,728-2,860 ft.

Hiawatha 1 H. Rowe, NW NW NW 20-7s-14w pumped 52 bbl., 20-qt. shot 2,444-52 ft., Cypress sand 2,444 ft., T.D. 2,452 ft.

North Boos, Jasper County: Texas 1 C. M. Jourdan, NE NE NW 8-6s-10e, flowed 1,184 bbl. in 22 hr., 3,000 gal. acid, McClosky 2,758-61 ft., 2,770-72 ft., T.D. 2,812 ft.

Omaha, Gallatin County: Carter 2 R. L. Carnahan, NW NW SW 4-8s-8e, pumped 86 bbl., 40-qt. shot 1,900-13 ft., Tar Springs 1,896 ft., T.D. 1,915 ft.

Parkersburg, Richland County: Sinclair 5 C. O. Clodfelter, N½ SE SW 29-2n-14w, flowed 1,310 bbl., 2,000 gal. acid, McClosky 3,109-20 ft., T.D. 3,120 ft.

(Continued on Page 93)

EASTERN TEXAS FIELDS

Limestone County Wildcat Makes Oil Well in Pettit

By D. H. STORMONT

DALLAS, Tex., Oct. 20.—Making approximately 90 bbl. of fluid daily, the B. F. Weekley 2-A Barron, E. Mabry Survey, will be completed as an oil well to open the Barron Pettit lime gas-distillate area of southwestern Limestone County to oil production.

Of the 90 bbl. of fluid, 35 to 40 bbl. is high-gravity oil and the rest is drilling water, acid water and mud. Derrick has been torn down, storage is being erected and a separator is being installed. Because of the unusually heavy concentration of mud and acid water, the oil is being treated as it comes from the well.

Production is from a 100-ft. section in the Pettit lime at 5,685-5,785 ft., which has been acidized with 4,000 gal. of acid. In addition to the oil, 2-A Barron is making 1,000,000 cu. ft. of gas daily, which will be taken by the Lone Star Gas Co. as soon as the well can be connected.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: East Texas field	5	242	17,982
Long Lake	3	271	16,083
Hawkins	7	2,347	33,794
Other fields	1	20	3,250
Dry holes: Wildcats	2	.....	9,655
Total	18	.....	80,764

Operator plans to let the well flow at capacity for the present in an effort to clean out the mud and water load.

In drilling, the test logged two good shows which have not as yet been investigated. In the upper and lower Glen Rose good oil shows were encountered at 4,300-50 ft. and 4,700-65 ft. In the event that production from the Pettit begins to show a decline, operator will plug back and perforate casing opposite the lower showing.

At the end of the week, operator at the Farrell Drilling Co. 1 Gilliam, Spence Survey, in Limestone County, was attempting to get a second drill-stem test of the Travis Peak formation. Last week the wildcat showed good porosity in the Travis Peak at 4,150-4,230 ft. and in the Pettit at 3,360-3,710 ft. Previously, a drill-stem test of the Pettit recovered 2,100 ft. of mud and fresh water. Water was also found in the schist, in which the test is bottomed at 4,869 ft., and as a result the outlook for the Travis Peak is not too encouraging.

Activity in Chapel Hill Revived

The discovery by the Texas Co. of an oil-producing Pettit horizon at a north outpost to the Chapel Hill field of Smith County, the prospects of the erection of additional gasoline-recycling plants and the possibility that the Railroad Commission may allow dual completions from the Paluxy and the Pettit formations has stimulated activity in the area.

One mile north of the Chapel Hill pool, where the Texas Co. recently extended the field and found production in the Pettit, the firm has taken additional acreage in the Levi Hands, W. Williams, N. Boule and S. T. Lovett surveys. Other companies which have taken substantial blocks are Shell, Sinclair Prairie, Sun, Mid-Continent Petroleum Corp., Hunt Oil Co., and E. L. Steck.

Two New Wildcat Tests Staked in District

On or before December 8, C. W. Killough plans to start drilling a 5,000-ft. test of the Woodbine sand in Freestone County. The wildcat will be drilled on a block of 3,200 acres lying entirely in the Manuel Raindo Survey, in the Turlington area in the eastern part of the county. The area is 2 miles northwest of a Woodbine sand gas producer owned by the F. H. E. Oil Co. The geology of the block is now being worked out.

In Red River County, Alex M. Snyder, together with O. T. Clark, drilling contractor, has staked location and are building derrick in the southwest corner of the Edmondson heirs 60-acre tract. The wildcat will test the Paluxy formation and may be carried to the Travis Peak.

It is being drilled on a 2,500-acre block east of the town of Woodland and 15 miles northwest of Clarksville. The block lies in the D. Perkins, W. Moore, P. B. Johnson, A. Jarman and Isaac Moore surveys.

EASTERN TEXAS COMPLETIONS

Wildcats

Limestone County: Farrell Drilling Co. 1 J. R. Gilliam, J. S. Spencer Sur., dry at 4,867 ft.

Red River County: Magnolia 1 Henry, 700 ft. from N and 640 ft. from lines 100-ac. tract in M.E.P.&P. Sur., dry at 4,788 ft.

East Texas Fields

(1-hour gage)

Longview, Gregg County: Shell 31 King, C. A. Thomson Sur., 60 bbl., perf. casing 3,562-67 ft., 3,579-84 ft., pay 3,532-3,652 ft., P.B. from 3,680 ft.

Tide Water-Seaboard 49 Lake Dervernia, W. G. Painter Sur., 49 bbl., pay 3,486-98 ft.

Kilgore, Gregg County: Bostex Oil Corp. 6 Angus Spear, M. V. Winkler Sur., 58 bbl., pay 3,547-56 ft.

C. R. Starnes 43 A. Money, B. A. Van Sickle Sur., 30 bbl., top of Austin 3,520-61 ft., pay 3,586-88 ft.

Bowles Oil Co. 20 D. Wills, M. Y'Barbo Sur., 45 bbl., top of Austin 3,479-3,557 ft., pay 3,650-60 ft.

Other Field Completions

Long Lake, Anderson County: Hunt Oil Co. 7 Broyles & Woolverton, E. Ewing Sur., 85 bbl., 7/64-in. choke, T.D. 5,363 ft.

Alex McCutchin 2-B J. A. Reagan, John Adams Sur., 114 bbl., 6/64-in. choke, T.D. 5,318 ft.

Tex Harvy 7 S. E. J. Cartmel, E. Ewing Sur., 72 bbl., 6/64-in. choke, T.D. 5,402 ft.

Mexia, Limestone County: Lytle & Phillips 1 Desenburg, P. Varela Sur., 20 bbl., 90 per cent salt water, T.D. 3,250 ft.

Hawkins, Wood County: Humble 1-B Bryan, M. A. Esparcia Sur., 362 bbl., ¼-in. choke, top of Woodbine 4,412 ft., pay 4,517 ft., T.D. 4,818 ft.

Humble 1 Holt, Brewer Sur., 101 bbl. in 6 hr., ¼-in. choke, top Woodbine 4,450 ft., pay 4,655 ft., T.D. 4,823 ft.

Humble 2 Prince, Brewer Sur., 103 bbl. in 6 hr., ¼-in. choke, top Woodbine 4,418 ft., pay 4,520 ft., T.D. 4,852 ft.

Humble 2 Williams, B. N. Hampton Sur., 112 bbl. in 6 hr., ¼-in. choke, top Woodbine 4,346 ft., pay 4,495 ft., T.D. 4,834 ft.

Navarro Oil Co. 5 Maberry, Moseley Sur.. 88 bbl. in 6 hr., ¼-in. choke, top Woodbine 4,413 ft., pay 4,500 ft., T.D. 4,794 ft.

Stanolind 1 Jeffery, H. F. Robinson Sur., 96 bbl. in 6 hr., ¼-in. choke, top Woodbine 4,470 ft., pay 4,630 ft., T.D. 4,853 ft.

Texas 3 Cobb, J. G. Heard Sur., 84 bbl. in 6 hr., ¼-in. choke, top Woodbine 4,350 ft., pay 4,514 ft., T.D. 4,820 ft.

EASTERN TEXAS ACTIVE WILDCATS

Camp County: Talco Asphalt Co. 1 McKenzie, L. Williams Sur., ¾ mi. W of Pittsburg field, 10.6 bbl. in 23 hr., 11/64-in. choke, T.D. 8,200 ft.

Delta County: Talco Asphalt & Ref. 1 W. T. Peek, 850 ft. from N and 575 ft. from W lines 100-acre lease in 150-acre tract, Wm. Ewing Sur., Pecan Gap 1,415-58 ft., top Austin 2,851 ft., Woodbine 3,221 ft., coring 3,550 ft.

Franklin County: C. D. Davis 1 F. J. Cox, 822 ft. from N and 624 ft. from E lines, J. M. Gill Sur., first report.

Henderson County: British American 1 Young, J. Rice Sur., 7½ mi. SW of Athens, prep. to reperf. casing, T.D. 8,476 ft.

Lone Star Gas 2 C. H. Allen, 3,490 ft. from W and 4,780 ft. from S lines J. Lawson Sur., top Pettit 9,334 ft., Travis Peak 9,492 ft., drilling 9,663 ft.

Hopkins County: W. B. Hinton and Talco Asphalt & Ref. 1 S. M. Long, 4,000 ft. from E and 650 ft. from S lines U. Acquier Sur., moving in material, first report.

Houston County: C. P. Culmore 1 G. T. Luncy, J. Forbes Sur., 1½ mi. SE Lovelady, set 10-in. casing at 300 ft., drilling 750 ft.

Hunt County: Cable Tool Drilling 1 J. D. Williams, 467 ft. from E and 2,175 ft. from S lines Wm. Elam Sur., set 10-in. casing at 325 ft., drilling 1,960 ft.

Limestone County: B. F. Weekley 2-A Barron, 660 ft. out of NE cor. 320-acre tract, E. Mabry Sur., testing, T.D. 5,786 ft.

Zephyr Oil 1 Barron, 337 ft. from NW and 300 ft. from SW lines E. Mabry Sur., rigging up.

Navarro County: J. B. Daniel 1 C. C. Willis, T. J. Jordan Sur., ½ mi. W Bazette, drill-stem test 3,092-3,165 ft., T.D.

Wood County: Humble 1 J. C. Snow, 467 ft. from W and 2,250 ft. from N lines J. B. Crain Sur., drilling 1,166 ft., first report.

Second Well in Hazleton Field Is Good McClosky Producer

By STAFF CORRESPONDENT

EVANSVILLE, Ind., Oct. 20.—The second well in the new field 3 miles east of Hazleton, Gibson County, swabbed 325 bbl. of oil in a 24-hour test following a 500-gal. acid treatment in the McClosky at 1,737-42 ft. The well, Walter Miller 1 Kerr, NE SW NE 26-1n-10w, is ½ mile southwest of the discovery well of the field and is to be put on pump. The well is expected to be completed as a 250 to 300-bbl. producer. It is bottomed in the McClosky at 1,742 ft. Two new locations have already been staked in the area.

SUMMARY OF COMPLETIONS

Indiana

	No.	Bbl.	Footage
Oil wells	4	88	5,852
Gas wells	1	*0.7	735
Dry holes	6		7,137
Total	11		13,724

Ohio

	No.	Bbl.	Footage
Oil wells	1	2	421
Gas wells	14	*9.6	34,504
Dry holes	9		21,032
Total	24		35,959
Recompletions: Dry	1		

Eastern Kentucky

	No.	Bbl.	Footage
Dry holes	4		3,748

Western Kentucky

	No.	Bbl.	Footage
Gas wells	2	*0.4	6,169

*Million cu. ft.

A southeast extension of the Mount Carmel field of Wabash County, Illinois, into Gibson County, Indiana, Princeton Mining 1 R. J. Smith, NE NE NE 21-1s-12w, has been completed in Cypress pay at 1,979-89 ft. The test produced 42 bbl. of oil on pump during the initial test. It was given a 10-qt. shot. Princeton Mining 2 Smith, SE NE SE 21-1s-12w, has been abandoned at a total depth of 2,340 ft.

The prospective pool opener in Posey County, Haynes-Thomas-Sloan 1 Scherer, NE NE NW 12-7s-13w, was drilling plug about 9 ft. off bottom at latest reports. No. 1 Scherer will test Tar Springs saturation in an area about 3½ miles south of production in the Caborn field.

INDIANA COMPLETIONS

Wildcats

Harrison County: A. E. Winning 1 Miller, SE SW SW 5-2s-9e, dry at 925 ft.

Knox County: H. A. Sprowls et al 1 Smith, E½ NW SE 14-4n-10w, dry at 934 ft., sand 919-25 ft., shaly sand 925-34 ft.

La Porte County: W. A. Anderson 1 Rodman, NE SW 32-36n-1w, location abandoned.

Posey County: Central States et al 1 Rueger, NW SW SE 25-6s-13w, dry at 2,825 ft., Clore 1,641 ft., Menard 1,816 ft., Waltersburg 1,913 ft., Tar Springs 2,031 ft., Glen Dean 2,132 ft., Hardinsburg 2,194 ft., Golconda 2,226 ft., Barlow 2,375 ft., Cypress 2,410 ft., Renault 2,565 ft., Aux Vases 2,580 ft., Ste. Genevieve 2,600 ft.

Fields

Bufkin South, Posey County: Charles Loveless et al 1 Dauswan, NE NW NE 25-6s-13w, pumped 20 bbl. oil and 5 bbl. water, natural, sand 1,680-85 ft., T.D. 1,691 ft.

Griffin, Gibson County: W. C. McBride 7 Blood, W½ SE SW SE 28-3s-14w, pumped 26 bbl., 20-qt. shot 2,178-88 ft., T.D. 2,188 ft.

Merom & Raley, Sullivan County: Trio Drlg. et al 1-A Huff, S½ NE NE NE 34-8n-10w, dry at 829 ft.
Paul Doran et al 1 Huff, S½ S½ S½ N½ 34-8n-10w, dry at 834 ft.

Oaktown, Knox County: Naomi O. & G. 2 Walden, loc. 261-5n-10w, dry at 790 ft.
National Consumers Oil 3 Wolf, NE SW NW NE 13-5n-10w, location abandoned.

Rockport, Spencer County: R. E. Cope et al 2 Parsley, N½ NW SE NE 31-7s-6w, pumped 4 bbl., 30-qt. shot 915-22 ft., T.D. 924 ft.

Miscellaneous, Daviess County: R. D. Brown, Inc., 4 McCracken, S½ NW NE 21-2n-6w, 700,000 cu. ft. gas, Cypress 714 ft., pay 725-32 ft., T.D. 735 ft.

Spencer County: L. L. Benoist 4 Prudential Life, NE NW SE NW 7-7s-7w, pumped 38 bbl. oil and 10 bbl. water, natural, sand 1,026-32 ft., 1,041-49 ft., T.D. 1,049 ft.

OHIO

NEWARK, Ohio, Oct. 20.—Prospect for gas pays in the Clinton sand at the deeper levels was given encouragement with Harrison County test making a fair showing of gas at 8 ft. in the sand. The East Ohio Gas Co., drilling its second test in Washington Township, topped the Clinton sand at 5,664 ft., the gas gaged 300,000 cu. ft. at 5,672 ft. where drilling was stopped in order to run 5⅛-in. casing; the lime was logged at 3,890-5,438 ft. The test is located in Section 32, on the W. L. Phillips tract.

In the northeastern section, the Portage County test by the Magnolia Petroleum Co. is showing for only 50,000 cu. ft. in the white Clinton. In Deerfield Township, Lot 55, the 1 H. A. Forney logged the lime at 2,757-4,539 ft., no stray or red Clinton found, white Clinton 4,720 ft., 50,000 cu. ft. gas at 4,779-81 ft., still drilling in sand at 4,826 ft.

Out of the crop of gas wells completed only three made better than a million cubic feet open flow.

OHIO COMPLETIONS

Ashland County

Vermillion Township: Stewart et al 2 Charles McCroy, Sec. 16, 600,000 cu. ft. gas, shot, Clinton, T.D. 2,748 ft.
Ohio Fuel 1 M. E. Vangilder, Sec. 24, 90,000 cu. ft. gas, shot, Clinton, T.D. 2,844 ft.

Athens County

Bern Township: Ohio Fuel 1 Dow Ross, Sec. 12, dry, Maxon (water), T.D. 1,107 ft.
Bern Oil & Gas 1 Hattie E. Harris, Sec. 11, 220,000 cu. ft. gas, Maxton, T.D. 1,185 ft.

Belmont County

Goshen Township: Barneville Dev. Co. 1 A. Robinson, Sec. 28, dry, Berea (water), T.D. 1,807 ft.

Harrison County

Moorefield Township: Frank Stranges 1 B. B. Barclay, Sec. 29, dry, Oriskany 4,329-39 ft., 3,000 ft. water in hole at 4,329 ft.; (reported as dry in Oriskany previously, will not be deepened, plugged).

Hocking County

Green Township: Griffin Prod. Co. 2 Henry Nutter, Sec. 5, dry, Clinton, T.D. 2,909 ft.

Ward Township: Ohio Fuel 7006 Sunday Creek Coal Co., Sec. 16, 580,000 cu. ft. gas, Berea, T.D. 1,013 ft.

Holmes County

Knox Township: Ohio Fuel 1 C. D. Phillips, Sec. 1, dry, Clinton, T.D. 3,346 ft.

Knox County

Union Township: Ohio Fuel 1 Olga K. Dawson, Sec. 17, 1,250,000 cu. ft. gas, shot, Clinton 2,993-3,012 ft., T.D. 3,015 ft.
Ohio Fuel 1 Burl Hammond, Sec. 16, 400,000 cu. ft. gas, shot, Clinton 2,792-2,808 ft., T.D. 2,836 ft.

Licking County

Madison Township: Ohio Fuel 4 Park Holmes, second quarter, 1,600,000 cu. ft. gas, Clinton 2,505-38 ft., T.D. 2,541 ft.
Ohio Fuel 1 H. L. Chatterton, second quarter, 720,000 cu. ft. gas, Clinton 2,571-2,603 ft.

Newton Township: Ohio Fuel 1 Ocie Kennedy, first quarter, 240,000 cu. ft. gas, Clinton 2,640-60 ft., T.D. 2,674 ft.

Medina County

Medina Township: Ohio Fuel 1 C. R. Powell, Lot 28, dry, Clinton, T.D. 3,134 ft.

Meigs County

Rutland Township: H. M. Nelson et al 1 James Woodard, Sec. 28, 800,000 cu. ft. gas, Maxon, T.D. 850 ft.

Sutton Township: Roy Proffitt et al 1 J. F. Jividen, Sec. 19, 1,500,000 cu. ft. gas, Gordon 3,025-55 ft.

Muskingum County

Harrison Township: Ohio Fuel 1 Henry Olden, Sec. 14, 970,000 cu. ft. gas, Clinton 4,217-44 ft., T.D. 4,246 ft.

Newton Township: Atha Co. 2 David Thompson, Sec. 18, 600,000 cu. ft. gas, Clinton 3,412-54 ft.

Noble County

Wayne Township: W. D. Lashley 1 fee, Sec. 3, 20,000 cu. ft. gas, Berea, T.D. 1,440 ft.
E. B. Ward 1 fee, Sec. 2, show oil, plugged after shooting, M-800 sand, T.D. 712 ft.

Washington County

Aurelius Township: Joe Hall 68 Levi Hall, Sec. 32, 2 bbl., shot, Buell Run, T.D. 421 ft.
Mistner Oil 1 Levi Hall, Sec. 32, dry, Buell Run, T.D. 525 ft.

Barlow Township: Ohio Fuel 4 H. J. Tresch, Sec. 10, dry, Squaw, T.D. 1,533 ft.; (old well deepened from 1,285 ft.).

Wayne County

Clinton Township: Brooks Johnson et al 1 F. Aylesworth, Sec. 18, dry, T.D. 3,163 ft.

EASTERN KENTUCKY

ASHLAND, Ky., Oct. 20.—Drilling operations continued on the same general level in eastern Kentucky this week but reports of completions slumped in comparison with former weeks. Two gas wells were completed in this area, however, and field reports indicate several other wells have reached or are near total depth.

The Kentucky-West Virginia Gas Co. has completed 628 Hope D. Wellman in Pike County at a total depth of 3,564 ft. with an open flow of 267,000 cu. ft. of gas daily from shale and Weir.

The Kentucky-West Virginia Gas Co. has also completed 644 W. L. Lewis on Daniels Creek in Floyd County at a total depth of 2,605 ft. The well has an open flow of 98,000 cu. ft. of gas from shale in 12 hours, rock pressure is 290 lb.

Floyd County

Kentucky-West Virginia Gas Co. operations:
638 Floyd Burchett, Sycamore Creek, 158 ft., slate, S.D., repairs.
648 F. M. Rice, Hunts Fork of Prater Creek, 2,230 ft., shale.
650 Harvey Clark, Buffalo Creek, 1,450 ft., lime.
654 James Nunnery, Mill Branch of Johns Creek, rigging up.
657 M. A. Davidson, Daniels Creek, rigging up.
5336 Preston Hamilton, Mitchell Fork of Mud Creek, 1,640 ft., Salt sand.
5337 A. R. Music, Crooked Branch of Johns Creek, 2,300 ft., slate.
5343 Nancy Hall, Frazier Creek, 1,136 ft., sand.
5347 Tolbert Akers, Branham Creek, 970 ft., sand.
5353 J. M. Porter, Levisa Fork, 950 ft., sand.
5355 John M. Layne, Clear Creek, 828 ft., Salt sand.
5356 Morgan Hall, Poplar Lick Fork, rigging up.
5364 Jasper Johnson, Lion Branch of Prater Creek, set machine.

Knott County

Inland Gas Corp. operations:
226 Hindman Settlement School, Smith Branch Carr Creek, started spudding.
227 W. R. Smith, Left Fork Troublesome Creek, 2,722 ft., black shale.

Kentucky-West Virginia Gas Co. operations:
639 R. L. Conley, Jones Fork, 1,990 ft., slate.
646 Clarence King, Isaac Fork, 1,785 ft., slate and shells.
5328 William Thornsberry, Bates Branch, location.
5330 Richard Hall, Right Beaver Creek, T.D. 2,750 ft., run tubing.
5338 John J. Slone, Caneye Fork, T.D. 2,946 ft., run tubing.
5339 Wilburn Thacker, 1,832 ft., sand.
5345 Gilbert Martin, Bear Branch of Jones Fork, 1,215 ft., sand.
5346 Thomas Hall, Dry Creek, road completed.
5348 David Martin, head Right Beaver Creek, 515 ft., Salt sand.
5349 Richard Hall, Dry Creek, 329 ft., slate.
5350 F. C. Akers, Right Beaver Creek, 790 ft., sand.
5358 Richard Hall, Right Beaver Creek, road completed.
5359 Henry B. Slone, Caney Creek, building road.
5362 Wilburn Pratt, Left Fork of Troublesome Creek, location.

Martin County

Kentucky-West Virginia Gas Co. operations:
5341 W. B. Preece, 2,555 ft., shale.
5357 C. W. Preece, Wolf Fork, location.

Magoffin County

Bed Rock Petroleum Co. 7 R. L. Salyer, Birch Branch of Burning Fork, 1,050 ft.

Inland Gas Corp. 228 T. B. Whitaker, Grassy Fork of Licking River, 1,398 ft., slate and shells.

Pike County

Kentucky-West Virginia Gas Co. operations:
627 Kentucky Matnard, 2,735 ft., shale.
635 James Blackburn, 880 ft., slate.
641 W. T. Honaker, 2,054 ft., Berea.
645 Roland Spears, Johns Creek, set machine.
647 Sallie Jackson, Johns Creek, rigging up.
649 Norma Cornette et al, Brushy Fork, 1,555 ft., Big lime.
651 Adron Lowe, Lowe Branch of Johns Creek, 1,270 ft., limy sand.
652 Thomas Deskins, Mare Creek, 20 ft., spudding.
653 Kentucky Maynard, Levisa Fork, location.
656 P. B. Stratton, Red Branch of Levisa Fork, moving.
658 J. S. Cline, moving.
5323 S. B. Leslie, Hollybush Branch, 1,160 ft., Salt sand.

(Continued on Page 92)

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Gas Well Opens New Sand in West Hiawatha Field

By T. R. INGRAM

DENVER, Colo., Oct. 20.—Completions in the Rocky Mountain area included several wells of considerable interest aside from the new production developed. In Colorado, the Texas Co. 7 Unit, on Wilson Creek, joint operation with the California Co., showed for 15 bbl. an hour through a ⅝-in. bean from the Morrison sand at 6,290-6,320 ft. It was drilled into the Sundance, which will not be produced at this time, but casing was set in that horizon so that it can be perforated at some future date. At present only the Morrison sand is being produced. The well is an outpost, ½ mile northwest of 4 Unit and ¾ mile southwest of the discovery. Wilson Creek is credited with being the highest important producing field in the country, if not in the world. Average elevation is 8,000 ft. above sea level, and at least one future location will be around 8,500 ft.

Mountain Fuel Supply 2 Lasher, West Hiawatha field, was completed for 993,000 cu. ft. of gas in sands of the Wasatch at 2,910-22 and 3,236-61 ft. This structure adjoins East Hiawatha field. Only five wells have been drilled on it in the past 10 years, all being completed in sands around 2,200 ft. The new well was drilled to explore deeper sands which yield oil on the east dome. It is classed as a gas discovery in a deeper pay.

SUMMARY OF COMPLETIONS

Colorado

	No.	Bbl.	Footage
Oil wells: Fields	1	360	6,515
Gas wells: Fields	1	*1.0	3,416
Total	2		9,931

Wyoming

	No.	Bbl.	Footage
Recompletions: Fields	1	250	5,436

Montana

	No.	Bbl.	Footage
Oil wells: Fields	6	841	16,816
Dry holes: Fields	1		3,000
Dry: Wildcats	1		2,912
Total	8		22,728

*Million cu. ft.

W. O. Taylor 1 Hoskins, Byron field, Wyoming, which was completed in the Tensleep at 5,366 ft. for 600-bbl. initial in 1936, was deepened to 5,436 ft. and recompleted for 250 bbl. The structure lies 3½ miles to the northeast of the Garland field. Its productive area in the Embar-Tensleep has not been determined, but approximately 1,300 acres have been proved within a closure of 1,000 ft., based on the syncline between it and the Garland field. The Taylor well is the lowest structurally drilled in the field and the deepening of it 70 ft. without picking up water confirms opinions expressed when it was completed in 1936 that the entire structure is full of oil and that ultimately it may be found productive in the Embar-Tensleep all the way across the syncline to the Garland pool.

Gus Pongratz 1 Clark, C NW NE 22-19n-104w, an important test in a fault block on the southwest flank of the North Baxter Basin gas field, is shut down for orders at 6,527 ft., after testing the Tensleep, top at 6,387 ft. In a drill-stem test at 6,505-27 ft., under 3,400-lb. rock pressure, it flowed hot sulfur water at the rate of 5,000 bbl. a day. Top of Embar was at 5,840 ft.

One of the shallowest fields in the Rocky Mountain area, in proportion to well capacity, is being explored by the Continental Oil Co. in its 3 Shoshone Indian lease on the Circle Ridge dome, 6 miles northwest of Maverick Springs field. It was showing oil in the Embar at 198 ft., and at 212 ft. it bailed 9 bbl. an hour on an 8-hour test. It then drilled into the Tensleep to 320 ft., and set the 8⅝-in. at 319 ft. The biggest production is expected in the last-named horizon.

The Cow Gulch Oil Co. has spudded in a rotary test on the Southwest Lance Creek structure in Niobrara County in its 1 Nelson, which will be watched with more than ordinary interest. The geology of the structure was worked out by Charles M. Rath, consulting geologist of Denver, and approved by Harry W. O'Borne, consulting geologist of Colorado Springs. The test, if successful, will prove up several thousand acres, and is expected to log almost identically with wells on top of the Lance Creek structure 3½ miles to the north. Contract was awarded Manning & Martin, Inc., to go to 5,600 ft., or 50 ft. into the Joss sand.

The superintendent of the Wind River Indian Agency, Fort Washakie, Wyo., opened bids October 10 for oil and gas leases on allotted and tribal lands on 2,470 acres in the Pilot Butte field, Fremont County, Wyoming, divided into 14 separate parcels. The Superior Oil Co. and British American Oil Co. submitted joint bids ranging from $3.50 to $50.10 per acre. An unusual feature of the offer provided that the secretary of the interior may require the successful bidder, singly or "in conjunction with" other lessees in the field to commence the drilling of a test to the Tensleep within 90 days. The tracts sold are scattered around the structure, and the interpretation given the requirement is that it was intended to prevent speculators from bidding in tracts and holding them until a deep test is drilled without expense to them in the hope of realizing a profit. The Superior and British American companies are expected to begin a joint test early in 1941 following approval of the leases. Tentative location of the test is reported in 15-3n-1w. The field has produced from shallow sands since 1916. Kinney-Coastal Oil Co. drilled two tests to the Dakota series, one completed for 83,000,000 cu. ft. and the other for 2,000,000 cu. ft.

The Billings Gas Co., which supplies gas from the Elk Basin field in Wyoming to Billings, Laurel and other cities and towns in Montana, has an expansion program under way to increase its available supply of gas. A field gas-conditioning plant is being constructed in the Garland field, and a 21-mile 8⅝-in. line will be built from that field to a connection with the line at Elk Basin. Another conditioning and compressor plant is being constructed at Elk Basin. Cost will be approximately $400,000. Stearns-Roger Manufacturing Co. of Denver has the contract.

COLORADO COMPLETIONS

West Hiawatha field, Moffat County: Mountain Fuel Supply 2 Lasher, NW NE NE 25-12n-101w, T.D. 3,416 ft., P.B. to 3,320 ft. into 7-in., perf. 2,910-22 and 3,236-61 ft., completed 993,000 cu. ft. gas.

Wilson Creek field, Rio Blanco County: Texas-California 7 Unit, NE SW SE 34-3n-94w, T.D. 6,515 ft., P.B. to 6,441 ft. in Sundance into 7-in., perf. opposite Morrison sand 6,290-6,320 ft., flowed 15 bbl. an hr. through ⅝-in. bean.

COLORADO DRILLING REPORT

Archuleta County: Navajo Oil Co. 1 Brooks, NE NE NW 2-32n-2e, spudded in 12½-in. hole, cable tools, to go to Dakota at around 1,100 ft., S.D. to complete rigging.

Cheyenne County: Elmer E. Whitson et al 1 Christian, C NW SE 12-13s-49w, derrick.

Huerfano County: Rheym & Tomkins 1 Two Pines, SE SE 31-28s-69w, drilling 1,196 ft., cased to 820 ft., heavy gas at 870 ft.

S. W. Pressey 3 Alamo, SW SW NW 10-27s-68w, drilling 1,204 ft.

Kiowa County: Stanolind 1 Snell, C SW SW 7-20s-41w, moving in.

La Plata County: Nick Spatter 1-X Bryce, C SW SW 31-33n-9w, resumed at 4,450 ft., cleaning out.

E. B. Klem 1 Olbert, NW SW 9-35n-12w, T.D. 4,290 ft., fishing tools.

Las Animas County: Barney Oil 1 Dutto-Marchisio, NW NW 32-33s-62w, drilling 1,530 ft. in sandy shale.

Logan County: Mutual Oil 1 State, C SW SW 32-7n-51w, T.D. 4,840 ft., perf. 5-in. opposite Muddy sand at 4,718-50 ft., water came in., perf. opposite stray sand at 4,490-4,500 ft., today.

Moffat County: Texas 13 Knowlton, NW NW NW 10-4n-91w, drilling 4,123 ft.

Privett & Spangler 1 Stillings, NE SE SE 12-5n-96w, drilling 1,695 ft. in shale.

Great Divide Petroleum 1 Wyatt, NW NW SE 6-9n-92w, S.D. 1,700 ft. for orders.

C. R. Privett 1 Sutton, NE NE SW 1-5n-96w, T.D. 2,420 ft., straightening hole at 2,346 ft.

Mountain Fuel Supply 9 Florence Wilson, NE SE NE 22-12n-100w, coring 2,018 ft.

Stanolind 19-M Parkinson, NW SW NE 22-4n-92, T.D. 3,516 ft., in highly saturated sand in basal Morrison at 3,467-3,502 ft., testing, old well deepened from upper Morrison at 3,462 ft., Iles field.

Stanolind 11-X Parkinson, CWL NE SE 22-4n-92w, location, first report, Iles field.

Rio Blanco County: Texas-California 8 Unit, NW SE NW 26-3n-9w, derrick.

United Oil Producers 1 Hill, Lot 13, 6-1n-101w, S.D. 1,300 ft.

United Producers 2 Hill, CEL Lot 13, 6-1n-101w, spudded, first report.

Routt County: Elk River Co. 1 Fred N. May, C SE SE 34-8n-86w, spudded with cable tools to go to Sundance at 2,600 ft.

WYOMING COMPLETION

Byron field, Big Horn County: W. O. Taylor 1 Hoskins, Lot 59, (SE SE) 25-56n-97w, T.D. 5,436 ft., deepened from 5,366 ft., in Tensleep, where it was completed in 1936 for 600 bbl., and recompleted for 250 bbl. a day on pump, set 5⅛-in. liner through 8⅝-in.

WYOMING DRILLING REPORT

Carbon County: Continental Oil 1 Frank M. Johnson, SE SE SW 1-24n-88w, drilling 1,679 ft. in shale.

Sinclair-Wyoming 27-A Wertz, CSL NW SW 6-26n-89w, drilling 1,597 ft.

Ohio Oil 1 Union Pacific, NE NE 33-20n-81w, drilling 2,340 ft.

Sinclair-Wyoming 26-A Wertz, NW SE SE 1-26n-90w (Sweetwater County), drilling 1,732 ft.

Sinclair-Wyoming 1 Mary Carter, NE SE SE 31-25n-88w, rigging up rotary.

Sinclair-Wyoming 5-F Mahoney, C NE NW 34-26n-88w, T.D. 4,512 ft., redrilling 3,920 ft.

Glen Swartout 3 Union Pacific, NE NE SE 21-22n-78w, T.D. 880 ft., cleaning out at 850 ft., carrying 8-in. at 767 ft.

Sinclair-Wyoming 25-C East Ferris, SE SE NW 25-26n-87w, S.D. 3,990 ft. for orders, top Chugwater red beds 2,470 ft.

Fremont County: Continental Oil 3 Shoshone, CEL SE NE 1-6n-3w, cmtd. 8⅝-in. at 319 ft., at 212 ft. bailed 9 bbl. an hr., 8-hr. period, from Embar.

Kirk Oil 6 Tribal, CNL NW SW 23-6n-2w, drilling 650 ft.

Indian Oil 4 Tribal, SW NW NW 23-6n-2w, moving in.

Lincoln County: H. C. Harris 1 Government, SE NW NW 23-21n-117w, drilling 3,505 ft. in brown sand topped at 3,480 ft.

Natrona County: Casper Creek Oil 1 State, SW SW NW 36-36n-81w, T.D. 2,640 ft., lowering 5⅛-in. for water shutoff.

Iba Dev. Co. 1, C NE SE 25-32n-82w, T.D. 1,628 ft., recemented 5⅛-in. 1,590 ft.

General Petroleum 17-35-G, NW NE SE 17-35n-77w, cmtd. 5½-in. 4,598 ft. on top Shannon.

General Petroleum 57-16-S, NW SW NE 16-35n-77w, rig.

K. S. Albert 1 Young, NE SE 25-32n-82w, T.D. 1,630 ft., cemented 5⅛-in. 1,590 ft., show oil.

Niobrara County: Lewis Gokel 2, CEL SW SE 2-34n-63w, drilling 510 ft.

Continental 14 Rohlff, NW NW SW 32-36n-65w, T.D. 5,182 ft., cemented 7-in. 5,155 ft., acid, 1,000 gal., swabbed and flowed 127 bbl. in 24 hr., reacid., 2,000 gal., testing.

J. L. Berggren 1 fee, SE NW 23-35n-63w, T.D. 2,749 ft. in Bell sand, preparing to test.

Cow Gulch Oil 1 Nelson, C SE SW 19-35n-65w, spudded, first report (see lead), Southwest Lance Creek.

Park County: Yale Petroleum 1-B Frisby, NE NE SE 32-52n-100w, drilling 3,325 ft. in red beds.

Husky Refining 4-A Rosseau, NW SE SW 33-51n-100w, cemented 16-in. 130 ft.

Stanolind 11-X Rosenberg, SE NE NE 26-58n-98w, T.D. 3,146 ft., top Embar 2,997 ft., Tensleep 3,050 ft., swabbed 6 bbl. per hr., installing pump.

MacKinnie Oil & Drilling 1 Northern Pacific, CNL NW NW 5-57n-99w, drilling 2,247 ft., will go to Dakota, water in second Wall Creek.

Enalpac O. & G. 3 Purple, NW SW SE 32-51n-100w, T.D. 3,617 ft., cemented 5½-in. 3,571 ft., top Embar 3,258 ft., Tensleep 3,554 ft., perf. 210 holes at 3,296-3,508 ft., testing.

Enalpac O. & G. 1 Custer, NE NE SW 32-52n-100w, rigging rotary.

Yale Petroleum 2-A Mattie, SW SW NW 33-51n-100w location.

Yale Petroleum 3-A Frisby, NE SW NE 32-52n-100w, location.

Sublette County: Texas 2-I Government, SE NW SW 27-27n-113w, spudded.

Sweetwater County: Sinclair-Wyoming 8 Hughes, SW SW SW 2-26n-90w, drilling 2,793 ft., top Sundance 2,345 ft.

Farson O. & G. 1 Government, C SE NE 18-25n-108w, drilling 1,750 ft.

Vermilion Oil 1 Government, SW NE NE 6-12n-99w, drilling below 2,100 ft. after running 10¾-in., show gas.

Carl Kundy 3, NE NE NW 32-46n-63w, drilling 700 ft.

Wesco Oil 6, NE NE SE 20-46n-63w, drilling below 100 ft., first report, Osage field.

MONTANA COMPLETIONS

Cut Bank field, Glacier County: Consolidated Gas 4 State, NW SW NE 26-35n-6w, T.D. 2,815 ft., 7-in. 2,725 ft., 92 ft., 5⅛-in liner cemented 2,785 ft., Cut Bank sand 2,767-2,809 ft., main pay 2,800-9 ft., swabbed 25 bbl. a day.

Texas 7 Esther Curren, C SE NW 8-32n-5w, T.D. 23,000 ft., upper Cut Bank 2,945-67 ft., dry, no lower Cut Bank, plugged and abandoned.

Wright-Haggerty 1 Tribal, SE SW SW 18-32n-5w, T.D. 2,945 ft., 7-in. 2,900 ft., show oil in Sunburst 2,825-80 ft., Cut Bank 2,900-20 ft., main pay 2,910-20 ft., swabbed 100 bbl. first 24 hr.

(Continued on Page 87)

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Sweetwater
Tyler
Wichita Falls

UTAH
Salt Lake City

WYOMING
Casper
Glenrock
Greybull
Lovell
Lusk
Medicine Bow
Rawlins
Thermopolis
Worland

Maryland Wildcat in Chert Close to Oriskany Sand

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Oct. 20.—The week was featured with interesting developments in all sections. In Maryland the wildcat on the Accident dome is now drilling in the Onondaga chert to the Oriskany sand. In West Virginia another large gas well in the Ravenswood wildcatting was completed; the rotary test in Lewis County is drilling in the Oriskany sand.

SOUTHWEST PENNSYLVANIA

The deep tests are all making progress but the majority are at a deep stage so it is now slow work. On Chestnut Ridge in South Union Township, Peoples Natural Gas Co. is drilling at 6,723 ft. in 5 Piedmont Coal Co. with a gage of 850,000 cu. ft. of gas from the chert beds in the Onondaga lime. Its No. 4 is drilling at 7,143 ft. and is cementing back on account of caving.

SUMMARY OF COMPLETIONS

Southwest Pennsylvania

	No.	Bbl.	Footage
Gas wells	11	*2.1	23,560

West Virginia

	No.	Bbl.	Footage
Oil wells	3	14	4,668
Gas wells: Oriskany	3	*40.5	15,240
Others	7	*3.0	15,605
Dry holes	4	.....	5,223
Total	17	.....	40,736

*Million cu. ft.

Here, New Penn Development Co., William E. Snee et al are drilling 1 Kirby at 6,047 ft. and 1 Carothers at 6,877 ft. and 4 Heyn at 775 ft. Greensboro Gas Co. is drilling 1 Barton at 6,452 ft. In South Huntington Township, Fayette County, Peoples Natural Gas Co. is drilling 1 Jacobs Creek Oil Co. at 3,015 ft.

In Richhill Township, Greene County, on the west flank of the Washington anticline, Natural Gas Co. of West Virginia is drilling 1 Andrew Workman at 2,200 ft. and carrying a 10-in. hole.

In Maryland the test of the New Penn Development Co. et al on the Humberson (Schartzer) farm on the Accident dome in Garrett County is drilling at 7,938 ft. The top of the Onondaga lime was corrected to 7,884 ft. and the top of the chert to 7,907 ft.

Armstrong County

South Buffalo Township: T. W. Phillips 1 F. Beale, 70,000 cu. ft. gas, Thirty-foot sand, T.D. 1,733 ft.

Clarion County

Porter Township: Squirrel Hill Gas Co. 4 Charles Fagley, 150,000 cu. ft. gas, Speechley, T.D. 2,570 ft.

Fayette County

Menallen Township: J. H. Cornell 1 Elizabeth King, 300,000 cu. ft. gas, Big Injun, T.D. 1,378 ft.

Greensboro Gas Co. 1 Charles S. Bixler, 112,000 cu. ft. gas, Injun sand, T.D. 1,760 ft.

Nicholson Township: Lingle & Upperman 1 Shroyer Bros., 450,000 cu. ft. gas, Squaw sand, T.D. 1,377 ft.

Greensboro Gas Co. 1 Alfred Cincy, 102,000 cu. ft. gas, Fifth sand 2,326 ft., gas 2,328-40 ft., T.D. 2,499 ft.

H. C. Scott et al 1 St. Francis Church, 400,000 cu. ft. gas, Gantz sand 1,890-1,918 ft., gas 1,902-18 ft., gas 1,924-31 ft., T.D. 1,950 ft.

Greene County

Wayne Township: Manufacturers 2 Halsie Tustin, 141,000 cu. ft. gas, Bayard sand 3,384-89 ft., gas 3,385 ft., T.D. 3,450 ft.

Indiana County

Rayne Township: T. W. Phillips 1 William B. Lightcap, 46,000 cu. ft. gas, Bradford sand, T.D. 3,400 ft.

Jefferson County

Beaver Township: T. W. Phillips 1 G. W. Plyler, 65,000 cu. ft. gas, Bradford sand, T.D. 3,053 ft.

Washington County

Amwell Township: Bungard et al 1 Manson & Sanders, 246,000 cu. ft. gas, first Salt sand 1,372 ft., gas 1,379 ft., T.D. 1,390 ft.

WEST VIRGINIA

In Lewis County the rotary test of the Hope Natural Gas Co. on the Alfred Woofter farm on the west flank of Chestnut Ridge in Freemans Creek district topped the Corniferous at 6,680 ft. and the Oriskany at 6,940 ft., and drilled to 7,164 ft. It was impossible to tell if the Oriskany sand produced gas while drilling through as some gas was being carried from upper sands which was present in the mud. A string of casing will be run to the Corniferous and both formations tested.

In Monongalia County, the Hope Natural Gas Co. topped the Onondaga at 7,346 ft. in the test on the H. C. Greer et al lease in Morgan district and set casing at 7,361 ft. in the chert and is now drilling out the plug after cementing casing.

Calhoun County

Sheridan district: South Penn Natural Gas Co. 3 Frank E. Rothlisberger, 935,000 cu. ft. gas, Maxton sand, T.D. 1,797 ft.

Sherman district: Paul Bowser 1 Edith Z. McDonald 5 bbl., Injun sand, T.D. 2,020 ft.

Hope 8566 McClellan Barr, 467,000 cu. ft. gas, Injun sand, T.D. 2,191 ft.

Clay County

Otter district: Pittsburgh Oil & Gas Co. 1 Hugh H. Boggs, dry, Injun sand, T.D. 2,074 ft.

Gilmer County

Center district: Hope 8563 Martha Turner, 355,000 cu. ft. gas after shot, Big lime 2,000-70 ft., Big Injun 2,070-2,165 ft., gas 2,070 ft., gas 2,154-62 ft., T.D. 2,227 ft.

DeKalb district: Clem S. Morris 1 W. F. and Oma Roberts, 200,000 cu. ft. gas, first Salt sand 1,640-1,758 ft., second Salt 1,800-52 ft., Maxton sand 1,855-1,915 ft., Big lime 1,980-2,025 ft., Big Injun 2,025-2,123 ft., gas 2,104-23 ft., T.D. 2,144 ft.

South Penn 9 C. W. Goff, 8 bbl., Maxton sand, T.D. 1,763 ft.

Hancock County

Grant district: R. J. Braden Co. 29 Hewitt heirs, 1 bbl., Berea, T.D. 885 ft.

Putnam County

Curry district: Reishman Oil & Gas Co. 1 H. C. Bell, 539,000 cu. ft. gas, Big lime 1,437-1,607 ft., Big Injun 1,622-74 ft., Berea 2,112-36 ft., brown shale 3,285-3,321 ft., gas 3,267 ft., gas 3,279-94 ft., T.D. 3,325 ft.

Ritchie County

Grant district: Reno Oil Co. 1 Daniel Loy, 47,000 cu. ft. gas, Keener sand, T.D. 1,737 ft.

F. R. Morrison 1 L. R. Northcraft, dry, Squaw sand, T.D. 1,905 ft.

Murphy district: Bickle Oil Co. 2 Ben and Leland Morris, 475,000 cu. ft. gas, Maxton and Injun sands, T.D. 2,184 ft.

Wirt County

Burning Springs district: S. W. Douglas 3 Kidwell heirs, light show, Cow Run sand, T.D. 372 ft.

Wood County

Williams district: Hoaglin Oil Co. 2 Lillian Dye, dry, Cow Run sand, T.D. 872 ft.

ORISKANY GAS FIELDS

Jackson County

Another large gas well was completed in the Ravenswood district wildcatting in Jackson County when the Columbian Carbon Co. completed the test on the Della Berry farm which gaged 18,151,000 cu. ft. of gas 1 hour after shot with a rock pressure of 1,770 lb. The Corniferous was topped at 4,896 ft.; Oriskany 5,014 ft. shot 5,014-54 ft., T.D. 5,058 ft. It is located about 4 miles south of Odaville.

In this district, the final gage of the United Fuel Gas Co. 5031 W. H. Shepard was 15,911,000 cu. ft. of gas with the Corniferous topped at 4,958 ft.; Oriskany 5,087 ft., and total depth 5,087 ft. The rock pressure at the end of 48 hours was 1,875 lb.

Ripley district: Columbian Carbon Co. 1 Lida L. Hinzman, 3,181,000 cu. ft. gas before shot, Corniferous 4,973 ft., Oriskany 5,090 ft., drilling 5,125 ft.

Washington district: United Fuel 5032 C. W. Starcher, 6,472,000 cu. ft. gas before shot, Corniferous 4,966 ft., Oriskany 5,082 ft., R.P. 1,865 lb., T.D. 5,095 ft.

Godfrey L. Cabot, Inc., 2 A. C. Good, 700,000 cu. ft. gas before shot, Corniferous lime 5,101 ft., Oriskany 5,242 ft., drilling 5,282 ft.

DRILLING

Ravenswood district: Joe Rubin et al 1 H. A. and O. H. Maddox, drilling deeper, Corniferous 4,879 ft., Oriskany 4,995 ft., S.D. 5,036 ft., now gaging 73,000 cu. ft. gas.

Ripley district: G. L. Cabot, Inc., 22 Putnam Co., top Corniferous 5,187 ft., Oriskany 5,281 ft., shut casing test at 5,290 ft., gaging 948,000 cu. ft. gas.

R. E. McCabe 1 Icy Hammack, Corniferous 5,119 ft., Oriskany 5,223 ft., drilling 5,235 ft.

United Carbon Co. 1 Marshall Brown, Corniferous 4,854 ft.

United Fuel Gas Co. 2 E. L. Harrison, Corniferous 4,839 ft.

Kanawha County

Poca district: Rex Oil & Gas Co. 2 Haynes heirs, 1,070,000 cu. ft. gas, Corniferous 5,212 ft., Oriskany 5,342 ft., drilling 5,366 ft.

Putnam County

Union district: West Virginia Gas Corp. 1 P. R. and Frank Wilson, 391,000 cu. ft. gas before shot, Corniferous 4,994 ft., Oriskany 5,089 ft., drilling 5,126 ft.

DRILLING

Union district: Columbian Carbon Co. 1 Central Trust Co., Big lime 1,674 ft., gas gage 365,000 cu. ft., S.D.

North Central Texas Fields

(Continued from Page 72)

Eastland County: Dobbs Oil Corp. 1 L. A. Hightower, Sec. 4, H.&T.C. Sur., Blk. 5, top Caddo 2,930 ft., dry at 3,310 ft.

Bryon & Stewart 1 G. D. Hall, Sec. 46, H.&T.C. Sur., Blk. 2, dry at 2,763 ft.

Lampasas County: Robertson & McKissick 1 A. M. Smith, D. W. Biggs Sur. 48, top Ellenburger 755 ft., dry 826 ft.

Shackelford County: Carl C. Broyles 1 R. C. Simpson, 2,050 ft. from S and 500 ft. from E lines of W½ Sec. 15, B.A.L. Sur., dry at 440 ft.

Carl C. Broyles 2 R. C. Simpson, 2,050 ft. from S and 650 ft. from E lines of W½ Sec. 15, B.A.L. Sur., dry at 432 ft.

Fields

Albany, Shackelford County: Mrs. M. J. Cross 16 A. S. Spears, 900 ft. from E and 1,350 ft. from W lines of Sec. 1, B.A.L. Sur., 7 bbl. pumping, 704-15 ft., T.D. 727 ft.

Carbon, Eastland County: Mauer & Kreb et al 1 A. S. Jackson, S. H. Key Sur., 7 bbl. pumping, top Caddo 2,542 ft., 100-qt. shot 2,557-2,611 ft.

Holt & Logan 1 Greer heirs, J. McCoy Sur., Abst. 595, top Caddo 2,506 ft., dry 2,585 ft.

Cook, Shackelford County: Roeser & Pendleton-Continental 5-A-117 W. I. Cook estate, Sec. 117, E.T.R.R. Co. Sur., 153 bbl., pumping 1,686-95 ft., T.D. 1,696 ft.

Crosscut, Brown County: Heitzell & Mendenhall 11 L. V. Edington, Robert G. Milliken Sur. 142, dry 1,337 ft.

Echo, Coleman County: Gilcrease Oil Co. 2 L. E. Walker, J. W. Hicks Sur. 265, dry at 2,019 ft.

Loving, Stephens County: Falls Refining Co. 1 J. S. Poer, Sec. 10, O.A.L. Sur., 300 bbl. in 16 hr., est. 400 bbl. capacity, top Caddo 3,508 ft., 2,500 gal. acid, 3,508-40 ft.

McMillian, Runnels County: Art Tucker et al J. T. Wylie, G. W. Dyer Sur. 482, dry at 2,354 ft.

Novice, Coleman County: States Oil Corp. 1 Mary C. Wilson, G. O. Berry Sur. 115, 216 bbl., 60-qt. shot 3,568-3,620 ft., T.D. 3,643 ft.

Stroud, Stephens County: T. G. Shaw, trustee, et al 1-B S. P. Stroud, Green Newton Sur., Abst. 128, 128 bbl., 30-qt. shot 3,043-63 ft., T.D. 4,500 ft.

View, Taylor County: Tal-Vez Oil Co. 1-B J. L. Lowe, 3,500,000 cu. ft. of gas daily, 1,000 gal. acid, 2,314-81 ft., T.D. 2,397 ft.

Wimberly, Jones County: Hedrick Oil Co. 1-B Sara T. Morrison, Guadalupe Martinez Sur. 137, 102 bbl. in 8 hr., est. 250 bbl. daily, 2,221-32 ft.

Miscellaneous Pools

Shackelford County: Grace T. Knight 2-B G. R. Davis, 212 bbl. pumping, 30-qt. shot 1,578-90 ft., T.D. 1,592 ft.

Earl Johnson 1 Ace Hickman, Sec. 16, L.A.L. Sur., dry 760 ft.

J. M. Browser 1 J. H. Elliott, Sec. 11, L.A.L. Sur., dry 940 ft.

R. H. Roark et al 10 J. H. Elliott, Sec. 12, L.A.L. Sur., 6 bbl. pumping, 825-29 ft.

Green & Haggerty 4 J. H. Elliott, Sec. 11, L.A.L. Sur., 15 bbl. pumping, 827-35 ft.

WEST CENTRAL TEXAS FIRST REPORTS

Haskell County: M. J. Delaney Co. 2 O. D. Swanson, 330 ft. from N and 990 ft. from W line Sec. 195, B.B.B.&C. Sur., 3,300-ft. test.

Edward C. Lawson 1 C. C. Rose, 489 ft. from S and 440 ft. from E line of 392-ac. tract, J. McCass Sur. 57, Abst. 95, 3,000-ft. test.

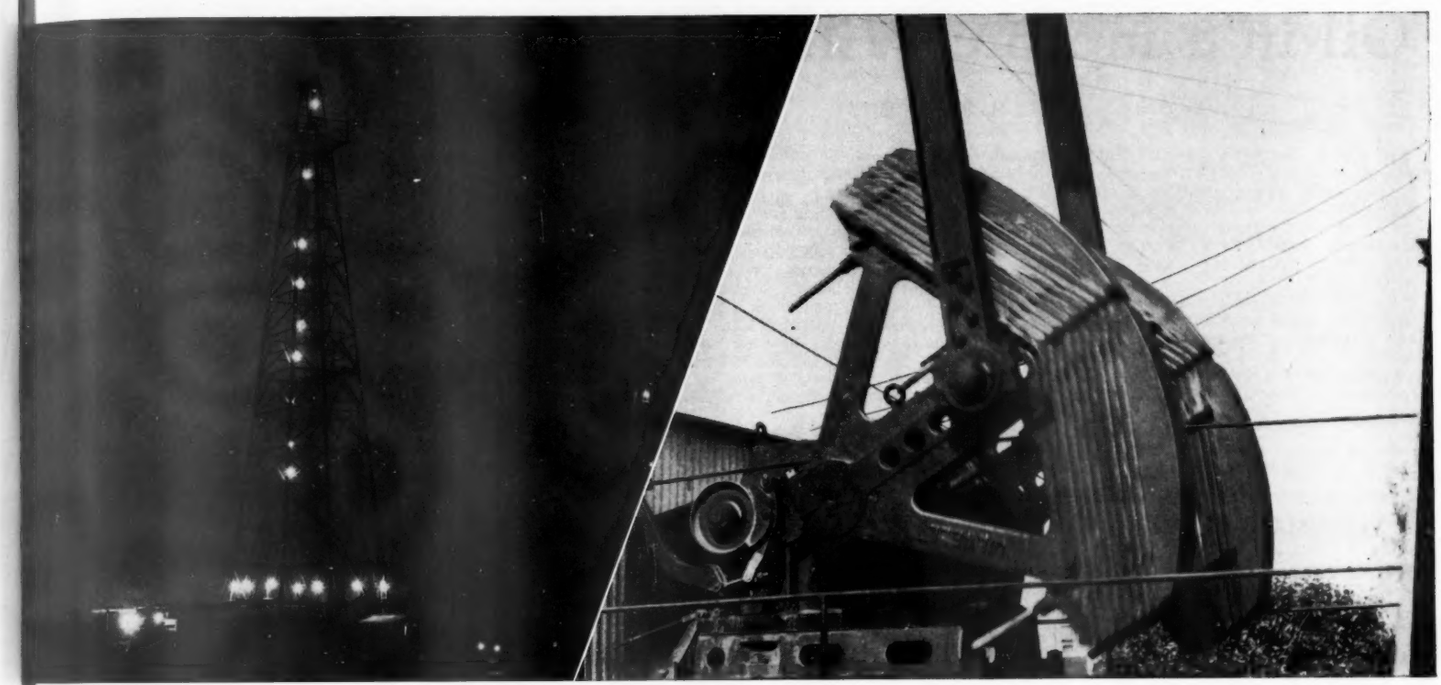
Jones County: T. J. Coyle 1 Clyburn, NW cor. tract in Lots 24 and 27, Holt subd., H. Millard Sur. 243, preparing to acidize, T.D. 2,398 ft.

Palo Pinto County: E. Lloyd 1 C. A. Dalton, 560 ft. from S and E lines of W. Lewis Sur., Abst. 229, No. 83, 1,500-ft. test.

Shackelford County: Jones and et al 1 T. W. Gresham, 660 ft. from N and W lines of SE¼, Sec. 7, B.A.L. Sur., 4,000-ft. test.

Stephens County: Cristie Bros. 1 H. M. Donnell (was Cox & Caprite 1 Donnell), 2,900 ft. from N and 400 ft. from E lines of Sec. 1208, T.E.&L. Sur., old well to be drilled deeper, old T.D. 3,270 ft., to deepen to 4,000 ft.

OUT OF THE NIGHT... AND THRU THE DAY



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South Sand Hills Test Makes Oil in Simpson; Will Deepen

By D. H. STORMONT

MIDLAND, Tex., Oct. 20.—One and one-half miles south of the Sand Hills extension area in southwestern Crane County, Continental Oil Co. is preparing to drill deeper at 1 Evan B. Jones et al. The wildcat has already indicated production from the Simpson sand by swabbing 48 bbl. of oil in 12 hours through 2-in. tubing from the brown sand at 5,730-50 ft. and at 5,905-27 ft.

The test will be deepened to test the Ellenburger lime, from which production ic derived in the south extension area. At the end of the week operator was mixing mud to displace circulating oil preparatory to deepening below 6,004 ft., total depth Circulating oil had failed to pick up shale cavings.

No. 1 Jones is 660 ft. out of the north corner of Section 12, Block 3, H.&T.C. Survey, and is 4 miles north of Simpson production in the Abell Ordovician pool in northern Pecos County.

SUMMARY OF COMPLETIONS

Southern West Texas

	No.	Bbl.	Footage
Oil wells: North Cowden	2	317	9,030
O'Brien	2	1,640	5,447
Other fields	8	5,875	25,932
Dry holes: Wildcats	3	.....	6,010
Total	15	.....	46,419

Northern West Texas

	No.	Bbl.	Footage
Oil wells: Seminole	3	1,880	15,995
Slaughter	14	14,159	72,226
Wasson	3	1,739	15,443
Other fields	1	330	2,750
Dry holes: Wildcats	1	.....	2,620
Total	22	.....	109,034

Texas Panhandle

	No.	Bbl.	Footage
Oil wells	11	2,736	33,233
Gas wells	2	*99.3	5,405
Total	13	.....	38,638

Southeast New Mexico

	No.	Bbl.	Footage
Oil wells	3	306	11,435
Dry holes	1	.....	1,770
Total	4	.....	13,205

*Million cu. ft.

In the Sand Hills south extension area, Gulf 29 Waddell was completed this week as the first oil producer for the area and at the same time became the field's largest producer. Following a 5,000-gal. acid treatment, 29 Waddell rated a daily potential of 9,770.40 bbl., flowing through casing and tubing. The potential was based on the last 4-hour flow of a 6-hour gage. Gas tested 15,623,000 cu. ft. daily and the gas-oil ratio was 1,599-1. The well is bottomed at 5,647 ft. in the dolomite.

Location is 663 ft. from the southwest and 666 ft. from the southeast lines of Section 18, Block 3, H.&T.C. Survey. No. 29 Waddell is a northeast offset to Gulf 17 Waddell, which was completed last March to open the 4½-mile south extension area.

Second Producer for Shallow Pay In Abell Permian Field

A south offset to Stanolind 1 Conry-Davis, the Abell Permian pool opener, is the Magnolia 1-B State-Myrick in northern Pecos County. Apparently promising production from a shallower pay in the field, 1-B State-Myrick showed 270 ft. of oil-cut mud and 1,080 ft. of clean oil from 2,249-2,308 ft. on a 30-minute drill-stem test taken through ⅝-in. bottom-hole choke. At the end of the week, operator was drilling ahead below 2,561 ft.

The discovery well produces from pay at 3,800-3,900 ft. Location of 1-B State-Myrick is 673 ft. east and 69 ft. south of the southwest corner of Section 31, Block 9, H.&G.N. Survey.

Deepest Wildcat in District Drilling in Upton County

The deepest test now drilling and one of the deepest ever drilled in West Texas is Plymouth Oil Co. 1 Alford, Section 50½, Block Y, P. B. Scott Survey, in east central Upton County. Making slow progress, the test had reached 10,027 ft. in chert, as the week closed. Only one show has been encountered in drilling. Between 7,004 and 7,150 ft. an odor of gas was noted in a number of cores cut, but a drill-stem test from 7,090-9,150 ft. failed to show any oil.

Wildcat Staked in Ector County

A wildcat in central Ector County, approximately midway between the Johnson, Harper and Goldsmith pools, has been staked by the Oil Well Drilling Co. as 1 J. L. Johnson, 476ft. from the north and west lines of Section 48, Block 44, Township 1s, T.&P. Survey.

Location is on farmout acreage from the Shell Oil Co. and is 1½ miles west and slightly north of a test which Shell and Landreth Production Corp. drilled to 5,308 ft. in the Holt horizon before plugging. However, oil shows were encountered at 4,280-4,300 ft.

No. 1 Johnson is contracted to 4,500 ft., which is the regular producing horizon for the Goldsmith, Harper and Johnson pools. It is on the extreme southeast edge of the Goldsmith lease held by Gulf Oil Corp. and, if it is completed for oil production, will prove thousands of additional acres of the lease.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hr. ratings based on last 3 hr. of 6-hr. gage)

Wildcats

Brewster County: Fred Turner 1 Turney, 330 ft. from N and 660 ft. from W lines Sec. 39, Blk. A-2, G.H.&H. Sur., dry at 2,001 ft.

Crockett County: Moore Bros. 1 Childress-Halff, elev. 2,338 ft., 467 ft. from S and 1,400 ft. from E lines of S½ Sec. 71½, Blk. GG, J. Owney Sur., dry at 1,502 ft.

Upton County: Jameson & Pollard 1-B Shirley, elev. 2,572 ft., dry at 2,507 ft.

Fields

Abell, Pecos County: Magnolia 1 Francisco, elev. 2,392 ft., 1,783 bbl., ½-in. choke, 5,089-96 ft., T.D.

Baker-Republic, Upton County: Trebol 7 Rogers, elev. 2,723 ft., 33 bbl. oil and 29 bbl. water, natural, 2,240-2,367 ft.

Cowden, Winkler County: C. L. Lyman 3 Cowden, elev. 2,823 ft., 541 bbl., 1-in. choke, T.D. 2,891 ft.

Hutchins, Ward County: Gulf 151 Hutchins, elev. 2,642 ft., 2,245 bbl., 200-qt. shot, 2,575-3,075 ft.

Johnson, Ector County: T. P. Coal & Oil 5 Johnson, elev. 2,958 ft., 644 bbl., 500-qt. shot, 4,130-4,325 ft.

Keyston, Winkler County: Texas 6 Campbell, elev. 2,890 ft., 301 bbl., 380-qt. shot, 3,080-3,270 ft.

McElroy, Upton County: Gulf 256 McElroy, elev. 2,752 ft., 173 bbl., 812-qt. shot, 2,915-3,140 ft., T.D. 3,150 ft.

T. P. Coal & Oil 1-A Bell, elev. 2,819 ft., old well drilled deeper, old T.D. 3,135 ft., new T.D. 3,227 ft., pumping 217 bbl., 200-qt. shot, 3,170-3,220 ft.

North Cowden, Ector County: Stanolind & Delaney 1-D Smith, elev. 3,050 ft., 151 bbl., 505-qt. shot, 4,260-4,450 ft., T.D. 4,470 ft.

Stanolind & Delaney 2-D Smith, elev. 3,044 ft., 166 bbl., 4,335-4,450 ft., P.B. from 4,560 ft.

O'Brien, Ward County: Gulf 186 O'Brien, elev. 2,660 ft., 188 bbl., 340-qt. shot, 2,576-2,670 ft.

Gulf 188 O'Brien, 1,452 bbl., 380-qt. shot, 2,639-2,777 ft.

Yates, Pecos County: Plymouth Oil 5 Bailey, elev. 2,900 ft., 155 bbl., 40-qt. shot, 1,803-44 ft., T.D. 1,848 ft.

SOUTHERN WEST TEXAS ACTIVE WILDCATS

Crockett County: L. S. Pittman 1 Bouscaren, 467 ft. from N and W lines Sec. 29, Blk. HH, H.E.&W.T. Sur., 2,500-ft. test, S.D., orders, 1,085 ft.

Crockett County: Jacobs & Gibson 1 University Sur., Blk. 29, Sec. 5, 990 ft. from S and 990 ft. from E lines, drilling at 85 ft., first report.

Culberson County: John Wolfe 1 Wilson-Briggs, 2,316 ft. from N and 1,500 ft. from E lines Sec. 1, Blk. 112, W. N. Older Sur., fishing tools 425 ft.

El Paso County: J. S. Meriwether 1 Bobadilla, 660 ft. from N and W lines, Scrap File 254, setting 8-in. casing at 265 ft., T.D. 637 ft.

Ector County: Oil Well Drilling Co. 1 J. L. Johnson, T.&P. Sur., Blk. 44, Sec. 48, T-1s, 467 ft. rfom N and 467 ft. from W lines, 4,500-ft. test, first report.

Glasscock County: E. M. Wahlenmaier 1 Texas Ld. & Tr., 467 ft. from W and S lines Sec. 15, Blk. 34, T.&P. Sur., 3,500-ft. test, drilling at 1,770 ft.

Irion County: B. C. Mann 1 M. Read, NE NE Sec. 2, Blk. 17, H.&T.C. Sur., drilling at 2,527 ft.

Pecos County: J. L. Cooper 1 University, SE SE SE, Sec. 13, Blk. 16, University Sur.

Cardinal Oil 1-3 University, 1,715 ft. from N and 2,370 ft. from W lines Sec. 3, Blk. 17, University Sur., set 10-in. casing at 457 ft., 7-in. casing at 1,300 ft., drilling at 1,377 ft.

Gulf 2 Millar, C NE SE Sec. 43, Blk. 11, Ordovician test, set 15½-in. casing at 108 ft., waiting on cement, T.D. 122 ft.

Reagan County: Amerada 1-RB University, NW NE Sec. 8, Blk. 48, University Land Sur., set 10¾-in. casing at 927 ft., drilling 4,560 ft.

Amerada 1-RC University, SE NE Sec. 4, Blk. 48, University Land Sur., 2-in. tubing to 2,391 ft., perf. casing 2,377-83 ft., 750 gal. acid, swabbing, P.B. 2,790 ft.

Upton County: Plymouth 1 Alford, C Sec. 50, Blk. 12, P. B. Scott Sur., drilling 10,025 ft.

Ward County: Shell Oil 1 Sealy-Smith, 2,310 ft. from S and 330 ft. from E lines Sec. 38, Blk. A, G.M.M.B. &A. Sur., Ordovician test, drilling 6,438 ft.

Winkler County: Magnolia 20 States-Walton, NW cor. Sec., Blk. 3-B, P.S.L. Sur., set 7-in. casing at 8,338 ft., drilling 8,415 ft.

Sam Weiner 1 Halley, NW NE Sec. 7, Blk. 11-B, P.S.L. Sur., S.I. 3,023 ft.

NORTHERN WEST TEXAS

Activity in the northern basin district slowed down a bit this week, although Mitchell County reported the completions of a producer and the location of a new wildcat. F. W. Merrick brought in the producer, completing 1 E. T. Strain for 219 bbl. of oil in 24 hours from a total depth of 1,753 ft. Previously, operator had administered a 620-qt. shot at 1,613-58 ft. Location of the new producer is in Subdivision 9, J. P. Smith Survey.

In the northwestern part of the country, the Westex Oil Co. of Big Spring has staked location for a wildcat test 8½ miles west of the town of Westbrook and 1½ miles east of the Howard County line. Staked as 1 R. M. Jones et al, the wildcat is located 467 ft. from the north and west lines of the W½ of the NE of Section 22, Block 29, Township 1n, T.&P. Survey. No. 1 Jones will be drilled with cable tools to contract depth of 3,100 ft.

Meanwhile, Mitchell County's deepest wildcat, Humble 1 Ellwood, Section 49, Block 16, S.P. Survey, has reached 7,080 ft. in sand and shale.

Lubbock County Discovery to Pump

In Lubbock County, 3½ miles northeast of the town of Lubbock, L. C. Harrison 1 Nairn, prospective pool opener, has cleaned out to near bottom and is running tubing to 4,980 ft. to test on pump. Bottomed at 5,002 ft., 1 Nairn is located in Section 25, Block A, J. H. Gibson Survey.

Gaines County Wildcat Reports Thinning of Section

Improved structural position for the 7,200-ft. wildcat test being drilled by Likins & Hall at 1 Jones, Section 13, Block A-7, P.S.L. Survey, in northwestern Gaines County, was reported this week, when a thinning of section was indicated. With an elevation of 3,667 ft., the wildcat topped the brown lime at 4,100 ft. Previously the test had topped the anhydrite at 2,130 ft., which is low to Permian lime failures in that part of the county.

At last reports, 1 Jones was drilling ahead in the anhydrite past 4,170 ft.

NORTHERN WEST TEXAS COMPLETIONS

(24-hr. rating based on last 3 hr. of 6-hr. gage)

Wildcats

Scurry County: Pearson & Sibert 1 Addison, 330 ft. from W and S lines S½ SE Sec. 122, Blk. 25, H.&T.C. Sur., elev. 2,279 ft., dry at 2,620 ft.

Fields

Dodge-Denman, Howard County: F. H. E. Oil Co. 1 Jones, elev. 2,264 ft., 330 bbl., pumping, 2,000 gal. acid, 2,532-2,750 ft., T.D. 2,750 ft.

Seminole, Gaines County: Amerada 4 Blakemore, elev. 3,418 ft., 585 bbl., ½-in. choke, 312-qt. shot, 5,142-5,350 ft., T.D. 5,350 ft.

Amerada 12 Turlin, elev. 3,377 ft., 863 bbl., ½-in. choke, 216-qt. shot, 5,171-5,315 ft., T.D. 5,315 ft.

Humble 4-B Blakemore, elev. 3,420 ft., 432 bbl., ½-in. choke, 5,120-5,330 ft., T.D. 5,330 ft.

Slaughter, Cochran County: Anderson-Prichard 1 Neal, elev. 3,979 ft., 437 bbl., 8,000 gal. acid, 4,920-5,030 ft., P.B. from 5,040 ft.

Atlantic 21 Boyd, elev. 3,669 ft., 849 bbl., 10,000 gal. acid, 4,950-5,068 ft., P.B. from 7,000 ft.

Honolulu Oil 10-18 Igoe Smith, elev. 3,653 ft., 888 bbl., 2½-in. casing outlet, 10,000 gal. acid, 4,995-5,040 ft.

Magnolia 4-A Mallett, elev. 3,644 ft., 1,415 bbl., 3-in. casing outlet, 10,500 gal. acid, 4,926-4,990 ft.

Slaughter, Hockley County: 12-B Mallett, elev. 3,604 ft., 953 bbl., 2½-in. casing outlet, 10,000 gal. acid, 4,945-5,026 ft., T.D. 5,026 ft.

Honolulu Oil 15-B Mallett, elev. 5,622 ft., 1,020 bbl., 2½-in. casing outlet, 10,000 gal. acid, 4,950-5,025 ft., T.D. 5,025 ft.

Magnolia 5-E Mallett, elev. 5,020 ft., 880 bbl., 3-in. casing outlet, 10,000 gal. acid, 4,962-5,020 ft., T.D. 5,020 ft.

Magnolia 7-E Mallett, elev. 3,585 ft., 1,156 bbl., 3-in. casing outlet, 10,500 gal. acid, 4,987-5,015 ft., T.D. 5,015 ft.

Stanolind 33-B Slaughter, elev. 3,535 ft., 933 bbl., 2-in. casing outlet, 10,000 gal. acid, 4,920-5,016 ft., T.D. 5,016 ft.

Stanolind 34-B Slaughter, elev. 3,538 ft., 872 bbl., 2-in. casing outlet, 10,000 gal. acid, 4,940-5,000 ft., T.D. 5,000 ft.

Texas Co. 3 Cattle Raisers-Neal, elev. 3,550 ft., 1,007 bbl., 13,000 gal. acid, 4,930-5,012 ft., T.D. 5,012 ft.

Texas Co. 36 Slaughter, elev. 3,561 ft., 1,100 bbl., 10,000 gal. acid 4,950-5,010 ft.

Texas Co. 37 Slaughter, elev. 3,531 ft., 1,546 bbl., 12,000 gal. acid, 4,985-5,000 ft., T.D. 5,000 ft.

Texas Co. 41 Slaughter, elev. 3,536 ft., 1,087 bbl., 10,000 gal. acid, 4,926-5,032 ft., T.D. 5,032 ft.

Wasson, Gaines County: H. W. Bass 6 Austin, elev. 3,299 ft., 626 bbl., ½-in. tubing choke, 228-qt. shot, 5,150-5,210 ft., T.D. 5,210 ft.

Continental and Carter 14-48 Wasson, elev. 3,546 ft., 1,038 bbl., 10,000 gal. acid, 4,910-4,966 ft., T.D. 4,966 ft.

Wasson, Yoakum County: Magnolia 10 Bennett, elev. 3,589 ft., 76 bbl., ½-in. choke, 6,000 gal. acid, 5,140-5,264 ft., T.D. 5,267 ft.

NORTHERN WEST TEXAS ACTIVE WILDCATS

Bailey County: Broderick & Calvert 1 G. H. Hayward, 4,167 ft. from W and 1,389 ft. from S lines of League 73, Sutton C.S.L. Survey., 5,500-ft. test, building derrick.

Borden County: Anderson-Prichard 1 Johnson & Clayton, Sec. 1, Blk. 1, John DeShanzo Sur., 660 ft. from SW cor. Sec. 23, Blk. 10, E.L.&R.R. Sur., 4,000-ft. test, moving in material.

M. L. Richards 1 W. R. Dunn, SW NE Sec. 307, Blk. 97, H.&T.C. Sur., 3,200-ft. test, S.D., orders, 2,854 ft.

Briscoe County: Phillips 1 Montague, NE NE Sec. 6, Blk. B-4, A.B.&M. Sur., drilling at 3,300 ft.

Cochran County: O'Neal Drilling Co. 1 Wright, NE cor. Labor 12, Lge. 60, Martin C.S.L. Sur., 3 mi. N of Dean area, fishing at 4,983 ft.

Crane County: Continental 1 E. B. Jones, 660 ft. from NE and NW lines Sec. 12, Blk. 3, H.&T.C. Sur., Ordovician test, top detrital zone 5,490 ft., Simpson 5,545-50 ft., preparing to drill below 6,004 ft.

Crosby County: George Callihan and C. L. Wager 1 E. M. Wahlenmaier, 460 ft. from N and E lines Sec. 3, Blk. D-15, Waxahachie Tap Sur., 3,200-ft. test, drilling at 2,365 ft.

Dawson County: Ray Albaugh 1 Handley, SE SW Sec. 36, Blk. M, E.L. Sur., 5,250-ft. test, top Yates 3,050 ft., San Andres 4,580 ft., waiting on cement, T.D. 4,977 ft.

Gaines County: Likins & Hall 1 Jones, SW NW Sec. 13, Blk. A-7, P.S.L. Sur., 7,200-ft. test, drilling 4,065 ft.

Garza County: Ed McAdams 1 K. Stoker, 1,320 ft. from S and E lines NE¼ Sec. 942, Blk. 97, H.&T.C. Sur., 3,500-ft. test, drilling 3,360 ft., H.F.W.

Lubbock County: Harrison & Foster 1 Steck, SE SE Sec. 7, Blk. A, J. Gibson Sur., 5,500-ft. test, set 10¾-in. casing at 210 ft., drilling 3,720 ft.

Lynn County: Trinity Drlg. Co. 1 Auld, 660 ft. from S and E lines of N½ SW¼ Sec. O, Blk. T, Callison Sur., 5,200-ft. test, S.D., orders, 5,202 ft.

Mitchell County: H. B. Owenby Drlg. 1 Morrison Oil & Royalty, SE NE Sec. 34, Blk. 29, T.&P. Sur., 3,100-ft. test, 8¼-in. casing at 1,566 ft., drilling 1,584 ft.

H. D. McQuain and W. J. Donnley 1 D. Wulfjin, NE SW Sec. 5, H.&T.C. Sur., 3,000-ft. test, spudded and S.D.

Terry County: American Drlg. 1 W. T. Hufnall, 467 ft. from E and S lines Sec. 14, Blk. D-14. C.&M. Sur., 5,500-ft. test, set 8⅝-in. casing at 260 ft., drilling 2,430 ft.

Yoakum County: Honolulu Oil 1-1e Wright, 467 ft. from N and W lines Sec. 13, Blk. D, J. Gibson Sur., 5,500-ft. test, top San Andres 4,560 ft., set 5½-in. casing at 5,183 ft., drilling plug, T.D. 5,262 ft.

Shell 1 M. L. Hammer, SW SW SW Sec. 490, Blk. D, J. Gibson Sur., P.B. to 5,351 ft. from 5,700 ft., 10,000 gal. acid, testing.

TEXAS PANHANDLE

AMARILLO, Tex., Oct. 20.—Completions in the Panhandle showed a decline when only 13 wells were completed, a drop of three from the previous week. Of the 13 completions 11 were for oil and 2 were for gas, with no dry holes. The oil wells rated a total daily potential of 2,769 bbl. and the two gas wells, 99,300,000 cu. ft.

During the week, 19 new locations were announced in the district. A revival of activity in the gas area of Moore County was noted with four new tests started. Hutchinson County led the field completions, having nine new locations, and, in addition to the four in Moore County, Gray County was given four new tests and Wheeler County one.

TEXAS PANHANDLE COMPLETIONS

(24-hr. ratings)

Gray County

Skelly Oil 2 Taylor, 24-B2, H.&G.N. Sur., 520 bbl., pumping, 2,925-90 ft.

W. H. Taylor 6 fee, 7-B2, H.&G.N. Sur., 49 bbl., pumping, 2,902-50 ft.

Texas 3 Taylor-B, 37-B2, H.&G.N. Sur., 253 bbl., pumping, 2,832-2,900 ft.

Texas 21 Davis, 9-1, A.C.H.&B. Sur., 85 bbl., pumping, 2,676-2,860 ft.

Hutchinson County

Danube Oil Co. 5 Sanford, 78-46, H.&T.C. Sur., 420 bbl., pumping, 2,808-32 ft.

Phillips 6 Supreme, 25-M23, T.C. Sur., 294 bbl., pumping, 3,185-3,271 ft.

Parton & Holt 9 Harvey, 15-X02, H.&O.B. Sur., 116 bbl., pumping, 2,955-3,008 ft.

Shell 34 Harvey-B, 14-M21, T.C. Sur., 346 bbl., pumping, 3,023-81 ft.

Stanolind 7 Moore, 21-M21, T.C. Sur., 360 bbl., pumping, 3,005-3,105 ft.

Texas 38 Pond, 1-M21, T.C. Sur., 71 bbl. in 8 hr., pumping, 2,955-3,085 ft.

Texas 18 Quinn, 7-9, I.&G.N. Sur., 113 bbl., pumping, 3,055-90 ft.

Moore County

Shamrock Oil & Gas Corp. 1 Luckhardt, 353-44, H.& T.C. Sur., 85,000,000 cu. ft. gas, 2,915-3,140 ft., P.B. from 3,495 ft.

Wheeler County

Fain & McGaha 1-E Grogan, 58-23, H.&G.N. Sur., 14,300,000 cu. ft. gas, 1,810-1,910 ft.

Eddy Discovery Flows by Heads

HOBBS, N. M., Oct. 20.—N. Hightower 1 Grier, new Eddy County sand discovery well 2¾ miles north of the Grayburg pool, is flowing oil by heads while drilling below 3,085 ft.

Main pay was topped in sand at 3,062 ft. and at total depth of 3,067 ft. the well filled with oil in 15 hours, later heading every 3 hours. Deepened to 3,072 ft., it was shut in for 8 hours and when opened kicked out 65 bbl. of oil in 1 hour. The strike is located in NW NW 31-16s-31e.

Another wildcat prospect, Sanders Brothers 1 Harry Leonard, 2 miles west and ½ mile south of the Hightower well, still is cleaning out after a 120-qt. shot from 2,940-80 ft., 2 ft. off bottom. No. 1 Leonard, located in NW SW 34-16s-30e, also 2¾ miles north of the Grayburg pool, is producing from lime. Slight showing of oil was logged at 2,912-17 ft., and an increase in oil and showings of gas were encountered from 2,953-65 ft. At 2,982 ft., the total depth, the well filled 1,500 ft. with oil.

(Continued on Page 89)

JOHN ZINK BURNERS

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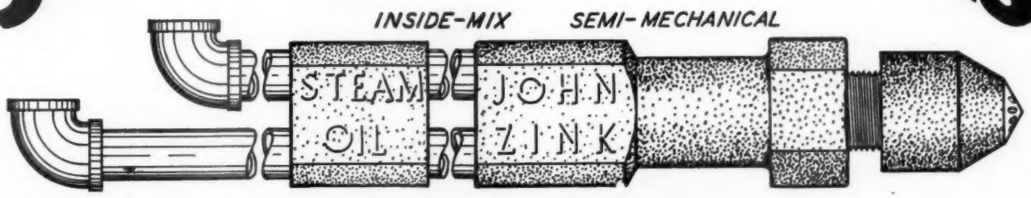
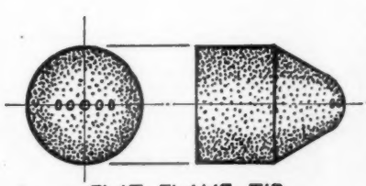
ATOMIZING OIL BURNER

INSIDE-MIX SEMI-MECHANICAL





FLAT FLAME TIP

The John Zink MT Steam Atomizing Oil Burner features a multiple tangentially drilled steam nozzle, which not only atomizes but spins the atomized oil. This burner has been further improved by a new patent baffle that assures further the equal distribution of the fuel to all burner tip ports. Burns oil with a gas burner heat pattern. Capacities 10 to 500 B. H. P.

ROUND FLAME TIP

JOHN ZINK COMPANY, Tulsa, Okla.

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New Production High Shows Gain Spread Evenly Over State

By ROBERT INGRAM

PRODUCTION set another new record for the state last week with a daily average of 259,800 bbl. Because of strict proration, the gain has been spread fairly evenly over the entire western producing area since last spring when the daily average was well below 200,000 bbl. Except for a few one-time leading pools—notably Wherry and Wellington which have fallen off rapidly in the last few months—all the major pools showed a proportional gain.

Bemis-Shutts last week ran 11,150 bbl., up about 1,500 bbl. from last spring. Bloomer ran 6,350 bbl., up from about 4,500 bbl. in June. So it was with Silica, up from 18,000 bbl. to 22,750 bbl., Zenith, up from 9,000 bbl. to 11,950 bbl. and other leading pools (see table). Greatest proportional and actual gain was from Russell County where the Trapp pool was running 23,900 bbl. as compared to about 18,000 bbl. last spring and the rest of the county was making 26,900 bbl. as compared to 22,000 bbl.

None of the new pools had as yet developed into major importance. Typical of the new development was the Peace Creek pool in Reno County along the Zenith pool Viola lime trend which last week ran 266 bbl. from eight producing wells drilled since July. Among other of the state's 28 new pools this year, many remained one-well pools while others, like the Dayton pool opened in 36-2-19w, Phillips County, were just getting their second producers.

Carter Oil Co., which took over the properties of H. L. Wirick in the Dayton pool, last week completed the second producer at Carter 1 Eltiste, SE SE 35-2-19w, for 55 bbl. from Kansas City lime. The well was drilled to a total depth of 3,545 ft., and acidized from 3,250-53 ft. The pool is the most northerly in the state.

Meanwhile, Kansas Corporation Commission officials revealed that the per-well allowable marks a peak of 28,722 bbl. based on the October allowable which allocated 199,699 bbl. of proratable oil divided among 6,952 wells. The figure marks a gain of nearly 10 bbl. over the low mark of April 1940 when 18,875 bbl. per well marked the per-well status in the prorated areas.

Average per-well allowables since April 1940 in Kansas follow:

1940—	
January	21.260
February	22.456
March	22.683
April	18.875
May	19.812
June	19.271
July	19.180
August	23,404
September	23,404
October	22,348
November	22,539
December	22,479
1941—	
January	22,897
February	22,577
March	23,523
April	25,027
May	25,608
June	26,551
July	26,726
August	28,064
September	27,695
October	28,722

SUMMARY OF COMPLETIONS

Kansas

	No.	Bbl.	Footage
Oil wells: Fields	22	23,861	73,086
Gas wells: Fields	4	*87.4	9,897
Dry holes: Fields	10	....	32,266
Wildcats	8	....	26,895
Total	44	....	142,144
Recompletions	2	281	....

Missouri

	No.	Bbl.	Footage
Dry holes: Wildcats	1	....	800

Iowa

	No.	Bbl.	Footage
Dry holes: Wildcats	1	....	2,758

*Million cu. ft.

Russell County Wildcat West Of Trapp Due to Test

One mile east of the old Gideon pool, and west of the Trapp district, Phillips Petroleum Co. was preparing to drill into the Arbuckle dolomite objective to test saturation. Earlier, Arbuckle formation was topped at 3,292 ft., logged oil showings in a 7-ft. penetration with rotary tools and set 5-in. pipe at 3,292 ft. for completion.

Kraft Pool Extended

The Kraft pool of northern Barton County was assured a ½-mile southward extension. Shell Oil Co., Inc., 1 Gibler, SE SE 16-17-11w, topped the Arbuckle dolomite at 3,257 ft., cored from 3,259 to 3,264 ft. and recovered 5 ft. of dolomite with good porosity and saturation. Crews set and cemented 4½-in. casing at 3,258 ft. and were waiting.

Dry Hole at Zenith

The first setback for the Zenith pool in Reno County was recorded during the week, marking the southern productive limits for the Viola lime. Cities Service Oil Co. 1 H. H. Kanatzar, in the N½ SW NW 18-24-10w, failed to find production after drilling to a total depth of 3,842 ft. in the Viola lime. It is the south offset to Tyson Dines Hunter lease, which has three prolific producers completed from the Viola lime.

KANSAS COMPLETIONS

Wildcats

Barton County: Helmerich & Payne 1-A Schultz, E½ NE NE 8-20-15w, dry, T.D. 4,006 ft., anhydrite 1,050 ft., Topeka 3,050 ft., Lansing 3,480 ft., conglomerate 3,802 ft., Arbuckle 3,984 ft.

Wakefield et al 1 McGill, S½ NE NE 18-20-14w, dry, T.D. 3,718 ft., anhydrite 845 ft., Fort Riley 1,920 ft., Lansing 3,287 ft., conglomerate 3,541 ft., Arbuckle 3,628 ft.

Elk County: Frank Oyster 1 Steward, NE NW SE 24-28-11e, dry, T.D. 1,350 ft., Lansing 710 ft., Kansas City lime 1,010 ft.

Graham County: Harbar Drilling 1 Wells, E½ NE SW 18-7-24w, dry, T.D. 4,395 ft., Fort Hays 675 ft., anhydrite 2,220 ft., Topeka 3,538 ft., Lansing 3,765 ft., Viola 4,275 ft., Simpson 4,367 ft., Arbuckle 4,382 ft.

Cities Service 1 Teall, NW NW SE 27-9-21w, dry, T.D. 3,955 ft., base Fort Hays 380 ft., anhydrite 1,790 ft., Topeka 3,307 ft., Lansing 3,546 ft., conglomerate 3,857 ft., Arbuckle 3,921 ft.

Greenwood County: LeBlanc et al 1 Mitchell, SW NW NE 29-27-12e, dry, T.D. 1,877 ft., Lansing 1,008 ft., Oswego 1,425 ft., Mississippian 1,804 ft.

McPherson County: Westgate-Greenlade & Phillips 1 Robertson, NE NE SE 22-20-3w, dry, T.D. 3,636 ft., Lansing 2,385 ft., Mississippian 3,054 ft., Viola 3,514 ft., Simpson 3,552 ft., Arbuckle 3,626 ft.

Stafford County: Tyson Dines 1 Blackburn, NW NW NE 18-24-11w, dry, T.D. 3,958 ft., anhydrite 595 ft., Kinderhook 3,753 ft., Viola 3,838 ft., Simpson 3,955 ft.

Fields

Ainsworth, Barton County: Stanolind 3 Kiltgen, E½ W½ NE 26-16-13w, pumped 3,000 bbl., Arbuckle 3,390 ft., 5-in. 3,390 ft., acid, T.D. 3,394 ft.

Northwest Ainsworth, Barton County: Continental 1 Harrington, SE NE SE 29-16-13w, pumped 366 bbl. oil and 23 bbl. water, Lansing 3,140-50 ft., T.D. 3,402 ft., P.B. 3,365 ft., 6-in. 3,400 ft.

Baird, Cowley County: E. B. Shawver 7 Baird-B, NW SE SE 17-34-3e, dry, T.D. 3,395 ft., Mississippian 3,373 ft.

Beaumont, Greenwood County: R. B. Molter 1 Ledgerwood, NW SE NW 36-27-8e, pumped 50 bbl., old well drilled deeper from Peru sand 1,840-57 ft. to Arbuckle 2,727-29 ft.

Big Creek, Russell County: Palmer 6 Neidenthal, S½ NW SW 23-14-15w, 367 bbl., Gorham, acid, T.D. 3,168 ft.

Bloomer, Rice County: Aylward 4 Volkland, E½ SW NE 5-18-10w, dry, T.D. 3,290 ft., Arbuckle 3,251 ft.

Burnett, Ellis County: Dickey 7 Carmichael-C, E½ NE NW 17-11-17w, pumped 3,000 bbl., Arbuckle 3,369 ft., T.D. 3,373 ft.

Chase, Rice County: McPherson 2 Cannon, NW SE 8-19-9w, 836 bbl., Arbuckle, T.D. 3,246 ft.

Cunningham, Pratt County: Skelly 5 Miller, N½ SW NW 36-27-11w, 243 bbl., Kansas City lime, T.D. 3,644 ft.

Skelly 5 Ratcliff, W½ SW SW 19-27-10w, 381 bbl., Lansing, T.D. 3,665 ft.

Skelly 2-C Steffins, N½ SW NE 35-27-11w, 2,640 bbl., Kansas City lime, T.D. 3,629 ft.

Forest Hills, Russell County: Snowden & McSweeney 1 G. Meier, SW SE SE 20-15-12w, dry, T.D. 3,334 ft., Arbuckle 3,313 ft.

Central 1 Meirer, S½ SW SE 14-15-12w, 1,536 bbl., Arbuckle, T.D. 3,334 ft.

Geneseo, Rice County: Continental 6 Poland, NW SE 30-18-7w, 432 bbl., Arbuckle, T.D. 3,200 ft.

Hall-Gurney, Russell County: A. H. Witt 1 Bangart, W½ SW SW 35-14-14w, dry, T.D. 3,260 ft., Arbuckle 3,238 ft.

Texas 3 Schnoor, NE NW SW 31-14-13w, swabbed 25 bbl., Lansing 2,943-3,028 ft., old well P.B. from 3,218 ft. in Gorham sand to 3,218 ft.

Shields 4 Rogg, S½ SW SW 28-14-13w, 146 bbl., Kansas City, acid, T.D. 2,951 ft.

Henne, McPherson County: McBride 2 Anderson, W½ NW NE 21-17-1w, 78 bbl., Mississippian chat, T.D. 2,681 ft.

Hugoton, Stevens County: Northern Natural 1 Madden, NE NE NW 1-33-37w, gaged 35,913,000 cu. ft. gas, Krider 2,630 ft., 7-in. 2,632 ft., acid, T.D. 2,821 ft.

Northern Natural 1 Swisher, SW SW SE 1-33-37w, gaged 23,842,000 cu. ft. gas, Krider 2,650 ft., 7-in. 2,644 ft., acid, T.D. 2,830 ft.

Northern Natural 2 Madden, SW SW SE 2-33-37w, gaged 25,764,000 cu. ft. gas, Krider 2,646 ft., 7-in. 2,638 ft., acid, T.D. 2,819 ft.

Laton, Rooks County: Cities Service 2 Reese, N½ NE SE 3-9-16w, pumped 177 bbl., Lansing 3,093 ft., 5-in. 3,130 ft., T.D. 3,182 ft.

O. F. Krueger, N½ NW NE 15-9-16w, 323 bbl., Kansas City lime, acid, T.D. 3,349 ft.

Macksville, Stafford County: Stanolind 1 Cornwell-B, W½ SE NW 3-24-15w, dry, T.D. 4,007 ft., Viola 3,974 ft.

McLouth, Jefferson County: Sherrod 1 Land, SW NE 33-9-20e, gaged 2,020,000 cu. ft. gas, Bartlesville 1,391-1,426 ft., T.D. 1,427 ft.

Peace Creek, Reno County: Simpson 4 Snowbarger, NE NE 21-23-10w, 3,000 bbl., Viola, T.D. 3,798 ft.

Propp gas, Marion County: Bennet & Abel 1 Propp, SW SW SW 8-19-4e, dry, T.D. 2,421 ft., Mississippian 2,347 ft.

Ray, Phillips County: Cities Service 3 Pinkerton-A, SW SE SW 29-5-20w, pumped 3,000 bbl., La Motte 3,626 ft., T.D. 3,634 ft.

Raymond, Rice County: Branine & Holl 2 Thompson, W½ W½ SW 17-20-10w, dry, T.D. 3,138 ft., Lansing 3,060 ft.

North Rock, Cowley County: E. B. Shawver 8 Shawver, NW SE SE 3-80-4e, dry, T.D. 2,855 ft., Bartlesville 2,787 ft.

West Silica, Barton County: Texas 1 Zecha, E½ SE SE 12-20-12w, swabbed 48 bbl., Arbuckle, T.D. 3,337 ft.

Teeter, Greenwood County: Eldorado 1 Noller, SW SE NE 9-23-9e, dry, T.D. 2,742 ft., Mississippian 2,642 ft.

Trapp, Russell County: Derby & Crow 1 Dietz, N½ NW NE 22-15-14w, pumped 697 bbl., Arbuckle, T.D. 3,259 ft.

Cities Service 8 Krug-D, NE SW SE 24-15-14w, 1,787 bbl., Arbuckle, acid, T.D. 3,333 ft.

Shell 4-B Batt, NW NE SE 2-16-14w, 1,546 bbl., Arbuckle, acid, T.D. 3,338 ft.

Wherry, Rice County: Mid-Plains 2 Nelson, S½ NE SW 12-21-7w, pumped 250 bbl. oil and 250 bbl. water, conglomerate 3,417 ft., T.D. 3,424 ft.

Wiggins, Greenwood County: Jones et al 1 Robertson, N½ NW SW 17-24-11e, abandoned machine.

Zenith, Stafford County: Champlin 3 Figger, S½ S½ NE 9-24-11w, dry, T.D. 3,824 ft., Viola 3,783 ft.

Miscellaneous, Butler County: Rex & Morris 9 De Moss-A, E½ SW SW 5-28-7e, pumped 35 bbl. oil and 10 bbl. water, Bartlesville 2,691-2,745 ft.

AVERAGE DAILY PRODUCTION

LEADING KANSAS FIELDS

	Oct. 18	Oct. 11
Augusta	1,300	1,300
Bemis-Shutts	11,150	10,700
Bloomer	6,350	6,200
Burnett	12,550	12,950
Burrton	7,300	7,200
Chase	7,100	5,950
Elbing	1,000	950
El Dorado-Towanda	6,950	6,900
Geneseo	7,450	6,100
Graber	3,000	2,750
Greenwood County	8,500	8,450
Hollow-Nikkel	1,400	1,450
Keesling-Midway	1,150	850
Lerado	300	600
Lorraine	1,400	1,400
Oxford	600	600
Rainbow Bend	900	850
Raymond	1,800	1,600
Ritz-Canton	3,800	3,700
Trapp	23,900	18,650
Balance Russell County	26,900	23,850
Sedgwick County	3,050	3,000
Silica	22,750	18,900
Voshell	1,650	1,600
Wellington	850	850
Wherry	2,750	1,400
Zenith	11,950	7,600
Others	82,000	75,300
Total Kansas	259,800	231,650

Rapid Development Planned At New Nebraska Pool

ST. JOSEPH, Mo., Oct. 20.—Skelly Oil Co. is reported planning swift development of the new pool at Barada, 8 miles north of Falls City in Richardson County, Nebraska. The company, after drilling the discovery well there, started a second well and now the contractor is building derrick for a third. Five miles

west of Salem, Neb., in Richardson County, a second well has been brought in for the pool opened by the Uhri Oil Co. Frank Power et al 2 Albin filled 1,100 ft. with oil from the Hunton lime. No. 1 Albin was

(Continued on Page 99)

Rocky Mountain Area

(Continued from Page 80)

Castle-Pardee 1 Tribal-198, SE NE NW 30-32n-5w, T.D. 2,951 ft., 7-in. 2,906 ft., Sunburst dry at 2,855-65 ft., Cut Bank 2,894-2,950 ft., main pay 2,940-50 1,000 ft. oil in hole, swabbing to test.

R. C. Jeffries 1 Tribal-197, NE SE NW 30-32n-5w, T.D. 2,910 ft., Sunburst 2,820-30 ft., Cut Bank 2,850-2,908 ft., main pay 2,891-2,908 ft., swabbed 360 bbl. first 24 hr., cleaning out after shot 100 qt. at 2,900-10 ft.

Frannie field, Carbon County: Continental 1 Merrill, SW SW SW 34-9s-25e, T.D. 3,556 ft., cemented 77 ft. 5½-in. liner on bottom, perf. 100 holes at 3,510-22 ft., swabbed 33 bbl. in 24 hr., top Embar 3,443 ft., Tensleep 3,465 ft.

Kevin-Sunburst field, Toole County: Imperial-Craig 6 Martin, CEL SE SE 18-35n-1w, T.D. 1,639 ft., contact 1,620-35 ft., 10 bbl. natural, acid, 500 gal., pumped 148 bbl. first 24 hr., 10 per cent water.

North Pendry wildcat, Teton County: R. C. Tarrant 1 Kellogg, SW NW NE 33-27n-5w, T.D. 2,912 ft., show oil and sulfur water in Cut Bank sand 2,698-2,726 ft., top Ellis 2,726 ft., top Madison 2,890 ft., small show oil 890-92 ft., water 2,894-2,912 ft., plugged and abandoned.

MONTANA DRILLING REPORT

Blaine County: Montana Gas 1 Dineen, C NW NW 2-31n-19e, spudded.

Carbon County: R. C. Tarrant 2 McKay, C SE NW 4-6s-18e, resumed at 3,057 ft., drilling 3,545 ft. in Chugwater, top 3,060 ft., 5½-in. 3,022 ft.

Fallon County: Carter 1 Northern Pacific, C SE SW 19-4n-62e, drilling 9,646 ft.

Glacier County: A. B. Cobb 1 Tribal-206, NW NW SW 19-32n-5w, drilling 800 ft., top Colorado 640 ft., 10¾-in. 652 ft.

Santa Rita 4 Jordan, C NE SE 7-32n-5w, drilling 1,470 ft., top Colorado 510 ft., 10¾-in. 546 ft.

Santa Rita 6 Rasmussen, CEL NE SE 32-33n-5w, drilling 1,640 ft., top Colorado 595 ft., 10¾-in. 603 ft.

Santa Rita 1 State, SW NE SE 25-33n-6w, spudding 260 ft.

Glacier Prod. 3 Maltby, CSL SE SE 5-33n-5w, drilling 1,265 ft., top Colorado 440 ft., 10¾-in. 470 ft.

Glacier Prod. 4 Corrigeux, CWL NW 21-33n-5w, spudded.

Texas 10 Morrison, C S½ NW 22-35n-6w, T.D. 145 ft., fishing bit

A. B. Cobb 1 Jeffries-Stufft, CEL SE NE 3-35n-6w, cemented 7-in. 2,896 ft.

Wm. Hanlon 2 Tribal-196, SE NE NE 30-32n-5w, rig, first report.

Wilkinson & Potter 3 Tribal-126, C N½ NW 7-32n-5w, rig, first report.

A. P. Consolidated 6 Keisel, CNL NW 11-34n-6w, spudded, first report.

Glacier Prod. 4 Rigney, SW SW NW 2-35n-6w, rig, first report.

Toole County: L. J. Yealy 16 Shaw, NW NW NE 35-36n-2w, T.D. 1,745 ft., shot 60 qt., rigging to pump.

Montana-Dakota Utilities 327 Donovan, C NW SE 31-34n-1w, drilling 925 ft., 10-in. 220 ft.

Hat Oil 1 Mitchell, C NE SW 24-37n-3w, S.D. 1,310 ft., repairs.

J. H. Agen 1 fee, C NW SE 16-35n-3w, drilling 1,780 ft., Sunburst 1,505-55 ft., 6⅝-in. 1,630 ft.

E. O. Reickhoff 1 Reickhoff, C NE SW 3-32n-2w, standing 60 ft.

J. H. Agen 18 Goeddertz, CSL NE SW 23-35n-3w, location.

Hannah-Porter 1 State, SW NE NW 13-33n-2w, T.D. 1,354 ft., Sunburst 1,195-1,226 ft., est. 1,000,000 cu. ft. gas, running 174 ft. 5⅛-in. liner.

Harmon & Morton 1 Sohn, SW SW NE 23-35n-3w, spudded to 60 ft. and S.D.

Montana-Dakota Utilities 329 Gypsy Parker, C SE NW 23-33n-2w, spudded, 8¼-in. 135 ft.

Nepstad Oil 3 Hugi, C SE NW 11-35n-3w, rig.

Casper T. Oien 12 Engermoen, NE SE NW 14-35n-2w, T.D. 1,453 ft., cemented 7-in.

Toles Drilling Co. 2 Nicholson, NW SE NE 28-35n-3w, spudded to 60 ft. and S.D.

Big West Oil 1 Anderson, SW SW NE 12-35n-4w, T.D. 400 ft., cemented off water with squeeze job.

A. A. Oil Co. 1 Fey, SW SE SE 32-37n-2e, T.D. 300 ft., waiting on 10-in.

Colonel Kevin Oil 10 Govt.; C NW NE 27-35n-3w, T.D. 990 ft., fishing, 8-in. 890 ft.

High Gravity Oil 3 Govt., SE NE SW 18-35n-3w, spudded.

Nepstad-Montgomery-Fargher 4 Haugen-2, CSL SW SW 2-35n-3w, spudded.

Montana-Dakota Utilities 1 John Reicker, C NW SE 11-36n-3w, drilling 1,085 ft.

Coolidge & Coolidge 1 Benjamin, C NW NW 9-33n-1w, spudded, first report.

Dakota-Montana Oil 26 Govt., CNL NE NW 19-35n-1w, rigging, first report.

Pfabe & Engelking 1 Danielson, CNL SE NE 20-35n-1w, T.D. 1,560 ft., 7-in. 1,395 ft., contact 1,551-60 ft., show oil, standing.

Gordon Plotke 4 Ward, SE SW SW 28-35n-3w, spudded, first report.

Superior Pet. 4-A Govt., C SE NW 24-35n-3w, T.D. 1,150 ft., set 8¼-in. 792 ft. for water shutoff.

Welch Brothers 5 Zachor, CWL NW NE 29-35n-1w, rig, first report.

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SOUTHWEST TEXAS

Crude Production Found on Flank of La Reforma Field

By F. L. SINGLETON

CORPUS CHRISTI, Tex., Oct. 20.—The apparent discovery of the first crude production on the La Reforma gas-distillate structure in Starr County, and the assurance of a second producer in the newly opened Petronilla field, Nueces County, were the highlights of development in the Southwest Texas district the past week.

The La Reforma gas-distillate field, northeastern Starr County was being converted into an oil field as J. L. Collins & Co. 3 Guerra, about 12,000 ft. northeast of production was expected to be tested following a drill-stem test in the Frio-Vicksburg formation that recovered pipe-line oil. Hard to medium sand with a gas odor was cored at 6,140-50 ft., while firm saturated oil sand was cored at 6,150-53 ft. A 15-minute drill-stem test at 6,140-53 ft. tested 280 lb. working pressure and when the first joint of the drill stem was broken, the well began flowing oil. Development in this area dates back to 1938 when the same company completed 1-A Guerra as a gas-distillate producer at 5,927-29 ft. It was one of the first structures to be found along the extreme south end of the Frio-Vicksburg trend, and its discovery was instrumental in the large scale leasing and geophysical program throughout the county which brought about the discovery of several important fields such as Rincon, Kelsey, Sun and several others. While it is too early to estimate the importance of this new strike, the Rincon field, now one of the largest crude reserves in the district was discovered in the same manner, and there is reason to believe that future development will mark La Reforma as an important crude reserve. Humble Oil & Refining Co., Magnolia Petroleum Co., Sun Oil Co., Texas Co., and several independent operators control considerable protection in the area.

SUMMARY OF COMPLETIONS

Lower Gulf Coast District

	No.	Bbl.	Footage
Oil wells: Fields	9	1,761	53,019
Gas wells: Fields	7	.....	47,728
Dry holes: Fields	1	.....	5,049
Wildcats	2	.....	11,730
Total	19	.....	117,526

Laredo District

	No.	Bbl.	Footage
Oil wells: Fields	9	831	35,340
Gas wells: Fields	1	.....	4,792
Dry holes: Fields	3	.....	5,015
Wildcats	5	.....	13,543
Total	18	.....	58,690

South Central Texas District

	No.	Bbl.	Footage
Oil wells: Fields	3	94	5,880
Dry holes: Wildcats	2	.....	2,716
Total	5	.....	8,596

Second Producer Assured for Petronilla

The new Petronilla field, Nueces County, was assured its second producer by the showing of Coquat, Buescher & Eaton 1-A Knight, 934 ft. north of the discovery well. Clean sand with a gas-distillate odor was cored at 6,948-58 ft., while sand showing oil was cored at 6,955-65 ft. A 15-minute drill-stem test at 6,960-65 ft. recovered 850 ft. of pipe-line oil and tested 30 lb. working pressure. An electrical log run to 6,367 ft. showed this well to have crossed the fault at 5,300 ft. or 750 ft. higher than the discovery well. Completion of the well in the above sand would open a new producing horizon in the Frio, several hundred feet higher than the discovery pay at 7,300 ft. Trading in this area has been extremely active and an active drilling campaign is anticipated.

Gus Tsemelis et al 1 P. S. Joseph, a wildcat located in the John M. Wade Survey, 3 miles southeast of San Diego in Jim Wells County was attracting attention as it cores ahead in shale below 5,850 ft. Three feet of sand with an oil odor was cored at 5,756-62 ft., while from 5,762-68 ft. no recovery was made but the formation cut like sand. Three drill-stem tests were attempted but all failed and it was decided to drill deeper.

Stratton Production Extended Into Kleberg County

Development along the Agua Dulse-Stratton trend in Nueces County continues the most active area in the district, and no let up in drilling is anticipated. Oil production of the Stratton field was extended into Kleberg County as Humble Oil & Refining Co. completed its first test on the King ranch as a producer. The well flowed 161 bbl. of 42-gravity oil daily through a 9/64-in. choke from sand topped at 6,568 ft. With production extending into the two counties, an attempt is being made to extend production into Jim Wells County. Location was made by the Chicago Corp. for 23 Wardner, Section 4 of the Paso Ancho de Arriba grant which offsets the Humble lease on the King ranch. In the meantime new activity is being started on the west and northwest flank where a new producing area and important extensions to production were recently made.

Live Oak County Discovery Makes Good Flow

Clark & Stelzig 1 Evertt, the discovery well of a new field in Live Oak County, flowed 180 bbl. of oil in 6 hours through a ½-in. choke Tubing pressure was 200 lb. and casing pressure 425 lb. A shake-out test showed 97 per cent oil and 3 per cent salt water. Gravity of the oil tested 20°. In the same area, but located as an extension to the White Creek field, Simmons 1 Kline continues to test through perforated casing at 1,816-20 ft. and is flowing 50 per cent oil and the balance salt water.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Bee County: Arkansas Fuel 1 J. W. Baird, dry, T.D. 4,515 ft.

San Patricio County: Henshaw 1 Hancock Mutual Life Ins. Co., dry, T.D. 7,215 ft.

Fields

Agua Dulce, Nueces County: Hiawatha Oil & Gas Co. 1 Rodgers, 1,700,000 cu. ft. of gas, 5/32-in. choke, T.D. 8,138 ft.

Hewitt & Dougherty 1 Cain, 50,000,000 cu. ft. of gas open flow, perf. casing 6,919-25 ft., T.D. 7,076 ft.

L. M. Lockhart 1 Wolter, 1,300,000 cu. ft. of gas, ½-in. choke, perf. casing 6,322-6,454 ft., T.D. 6,507 ft.

Richardson 1 Knight, 250 bbl., ⅛-in. choke, perf. casing 7,116-30 ft., T.D. 7,145 ft.

Cologne, Victoria County: Cox & Hamon 1 Ysidore, dry, T.D. 5,049 ft.

Fagan, Refugio County: P. R. Tutherford 3-C Fagan, 63 bbl., 3/32-in. choke, perf. casing 5,629-35 ft., T.D. 5,641 ft.

La Gloria, Jim Wells County: La Gloria Operators 1 Unit 16, 325 bbl., open flow, perf. casing 6,180-6,730 ft., T.D. 6,900 ft.

La Gloria Operators Committee 1 Unit 18, 167 bbl., 7/64-in. choke, perf. casing 6,670-6,700 ft., T.D. 6,961 ft.

Magnolia 1 Conkle, 35,000,000 cu. ft. gas, open flow, perf. casing 7,157-68 ft., T.D. 7,500 ft.

Minnie Bock, Nueces County: Graham 1 Conelly, 88 bbl. oil and 50 bbl. salt water, ⅛-in. choke, perf. casing 3,822-26 ft., T.D. 3,850 ft.

E. A. Graham 2 Riedel, 40 bbl. fluid, 10 per cent salt water, jetting, perf. casing 3,798-3,804 ft., T.D. 3,817 ft.

North McFaddin, Victoria County: Transwestern 1-F McFadden, 10,000,000 cu. ft. of gas, perf. casing 5,193-95 ft., T.D. 5,250 ft.

Gulf 3-B Noble, 20,000,000 cu. ft. of gas, perf. casing 5,150-60 ft., T.D. 6,227 ft.

Placedo, Victoria County: Barnsdall 15 Pickering, 132 bbl., 7/64-in. choke, perf. casing 6,031-36 ft., T.D. 6,150 ft.

Shield, Nueces County: Phillips 1 Carl, 90,000.000 cu. ft. of gas, ⅛-in. choke, T.D. 7,030 ft.

Stratton, Nueces County: Southern Minerals 28 Stratton, 56 bbl., 7/64-in. choke, perf. casing 6,654-70 ft., T.D. 6,690 ft.

Tom O'Connor, Refugio County: Quintana 29-B Heard, 650 bbl., ¼-in. choke, perf. casing 5,854-64 ft., T.D. 5,925 ft.

SOUTHWEST TEXAS DRILLING REPORT

Aransas County: Gulf 1 Virginia Hallinan, Luke A. Falvel Sur., 5 mi. north of Lamar, drilling shale 7,710 ft.

Brooks County: Standard Oil Co. of Texas 1 K. J. Hocker, T.D. 5,510 ft., swabbed salt water 5,137-75 ft., squeezed perf., W.O.C.

Duval County: Humble 1-E Welder, J. Poitevent Sur. 222, drilling shale 4,413 ft.

Luling 1 F. Salinas, Sec. 18, top Hockleyensis 4,161 ft., coring shale 4,607 ft.

Gonzales County: Randon Oil Co. 1 Dunning, Joseph Dillard Sur., 8 mi. southeast of Gonzales, top Wilcox 3,350 ft., drilling shale 4,190 ft.

Live Oak County: C. G. Newton 1 Schule, S. B. Eves Sur., drilling shale 1,300 ft.

San Patricio County: Fred W. Shield 1 J. M. Clemons, I.&G.N.R.R. Sur., 2½ mi. northwest of Mathis, drilling shale 1,517 ft.

Starr County: Magnolia 1 Hinojosa, Santiago de La Garza grant, Porcion 110, 3 mi. southwest of Cuevitas field, spudded, first report.

Sun 1-C Montalvo, Los Retaches grant, 1½ mi. north of Sun field, spudded.

Victoria County: Gulf 1 McFaddin, E. McFaddin Sur., drilling shale 3,300 ft.

LAREDO DISTRICT

Wildcats

Duval County: R. Benjamin 1 Bain, dry, T.D. 1,900 ft.

Graham 1 Yeager, dry, T.D. 1,073 ft.

Magnolia 1 Duval County Ranch Co., dry, T.D. 2,675 ft.

Webb County: Magnolia 1 Santo Tomas ranch, dry, T.D. 6,830 ft.

Harry E. Murray 2 Adami, dry, T.D. 1,065 ft.

Fields

Casa Blanca, Duval County: Adelon Oil Corp. 2-D Martin, dry, T.D. 1,232 ft.

Charamousca, Duval County: N. V. Duncan 4-A Worden-Drought, dry, T.D. 1,608 ft.

Chiltipin, Duval County: Chiltipin 1 Garza, 1,500,000 cu. ft. gas open tubing, perf. casing 4,726-57 ft., T.D. 4,792 ft. This well abandoned last week in error.

Colorado, Jim Hogg County: Humble 36-B King, 180 bbl., ¼-in. choke, sand 3,039-55 ft.

C. Andrade 3-I Trevino, 41 bbl., 12 hr., 5/32-in. choke, T.D. 2,836 ft.

Kelsey, Brooks County: Humble 78 McGill, 166 bbl., 9/64-in. choke, T.D. 4,969 ft.

Navarro 1 Trevino, 121 bbl., ⅛-in. choke, perf. casing 4,746-51 ft., T.D. 4,806 ft.

Killam, Webb County: Mims & Abel 1 Laurel, 55 bbl., pumping, perf. casing 2,027-34 ft., T.D. 2,080 ft.

Piedra de Lumbre, Duval County: Magnolia 31 Duval County Ranch Co., 75 bbl., ⅜-in. choke, perf. casing 2,126-28 ft., T.D. 2,133 ft.

Sejita, Duval County: Trinity Gas Co. 2 Jack Casey, 130 bbl., ⅜-in. choke, perf. casing 5,670-85 ft., T.D. 5,891 ft.

South Rincon, Starr County: Sun 1 Yturria Land & Livestock Co., 16 bbl., 7/64-in. choke, perf. casing 4,232-33½ ft., T.D. 4,889 ft.

Sun, Starr County: Sun 1 Perez, 47 bbl., ⅛-in. choke, perf. casing 4,661-59 ft., T.D. 4,749 ft.

Tarancahuas, Duval County: Cox & Hamon 8 Hoffman-Rosemary, dry, T.D. 2,175 ft.

SOUTH CENTRAL TEXAS DISTRICT

Wildcats

Caldwell County: Fred J. Adams 1 Bankers Life Co., dry, T.D. 1,981 ft.

Williamson County: George Gage 1 Marcon, dry, T.D. 735 ft.

Fields

Floresville, Wilson County: H. J. Baker 1 Meyers, 2 bbl. oil and 3 bbl. water, sand 635-39 ft., T.D. 640 ft.

Tenney Creek, Caldwell County: Ellmag 3-C Jeff Conelly, 48 bbl., ¼-in. choke, T.D. 2,560 ft.

Wiegand 4 Hill, 44 bbl., ⅛-in. choke, T.D. 2,680 ft.

Oklahoma Fields

(Continued from Page 71)

Miscellaneous

Creek County: Abraham 1-B Wyatt, SW SW SW 18-17-10, pumped 7 bbl., Bartlesville 2,245-97 ft., shot, T.D. 2,297 ft.

Strozier 4-A House, NW SW SE 22-17-11, pumped 50 bbl., Wilcox 2,494 ft., 5-in. 2,181 ft., T.D. 2,502 ft.

Briggs 1 Coonrod, NE NW NE 27-18-9, pumped 28 bbl., Prue 1,979 ft., 8-in. 1,534 ft., T.D. 2,016 ft.

Muskogee County: Jim Joseph 8 Liston, NW NW NW 26-17-15, pumped 5 bbl. oil and ½ bbl. water, sand 1,034-44 ft., T.D. 1,044 ft.

Tulsa County: Keener 6 Devinn, NW NE NW 13-21-12, pumped 4 bbl., Burgess 1,420 ft., 6-in. 1,400 ft., T.D. 1,467 ft.

Recompletions

Altus, Jackson County: Pioneer 4 Hardcastle, NE SE SW 15-1-20w, pumped 6 bbl., 7-in. 1,371 ft., old T.D. 1,413 ft., T.D. 1,465 ft.

Cromwell, Okfuskee County: Carter 5 Dunn, SW SE NW 3-10-8, pumped 25 bbl., Cromwell 3,396-3,452 ft., old T.D. 3,426 ft., T.D. 3,490 ft.

Empire, Stephens County: Cities Service 17 Surber, E½ SE SW 33-1s-8w, pumped 323 bbl. fluid, 1.8 per cent water, pay 2,256-78 ft., old T.D. 1,680 ft., T.D. 2,350 ft.

Knox, Grady County: Raizen 3 Nations, NW NW SE 34-3-5w, temporarily abandoned, T.D. 1,951 ft.

St. Louis, Pottawatomie County: Denver 2 Decker, SW SW SE 8-7-4, pumped 325 bbl. oil and 2,000 bbl. water, old T.D. 4,027 ft., T.D. 4,085 ft., acid.

Northern State 2 Williams, NW NE NW 14-7-4, flowed 15 bbl. oil and 5,000,000 cu. ft. gas, Earlsboro 3,372 ft., old T.D. 3,179 ft., T.D. 3,424 ft.

Phillips 1 Light, SW SW SE 18-7-4, pumped 8 bbl., Earlsboro 3,810 ft., old T.D. 4,194 ft., T.D. 3,839 ft.

Velma, Stephens County: Skelly 6 Martin, SE NW NW 36-1s-5w, pumped 30 bbl., pay 820-46 ft., old T.D. 824 ft., T.D. 846 ft.

Input Wells

Glenn Pool, Creek County: Gulf and Sinclair 24 Vowell, NW NE SW 16-17-12, T.D. 1,559 ft.

Tulsa County: Birdcreek 19 Blackwood, S½ NW SE 31-22-13, T.D. 1,267 ft.

AVERAGE DAILY PRODUCTION

LEADING OKLAHOMA FIELDS

	Oct. 18	Oct. 11
Allen	4,050	4,075
Billings	6,250	6,250
Burbank	8,350	8,400
South Burbank	7,600	7,675
Balance Osage	17,700	17,850
Blackwell district	3,400	3,350
Bristow-Slick	6,400	6,350
Cement	12,250	12,400
Coyle	4,150	4,100
Crescent	1,450	1,475
East Cromwell	4,250	3,600
Cromwell	2,750	2,725
Cumberland	7,200	7,200
Cushing-Shamrock	8,800	8,725
Dill	2,500	2,850
Duncan	3,450	3,400
Edmond	3,250	3,200
Fish	4,050	4,150
Fitts	10,650	10,800
Jesse	1,975	2,025
Graham-Fox	2,075	2,025
Guthrie	3,300	3,050
Healdton	8,400	8,425
Hewitt	17,150	17,450
Keokuk	2,850	2,875
Konawa	925	950
Lucien	5,650	5,625
Moore	900	875
Northeastern counties	17,300	17,450
Oklahoma City	79,050	88,700
Olympic	1,500	1,450
Ramsey	4,675	4,625
Sasakwa	1,050	800
Sholem-Alechem	2,500	2,350
Stroud, East	1,800	2,350
Seminole district:		
Bowlegs	5,500	5,525
Carr City	2,100	2,050
Dora	1,100	1,075
Earlsboro	3,525	3,450
East Earlsboro	1,650	1,600
South Earlsboro	525	500
Little River	6,150	6,100
East Little River	625	650
Mission	1,175	1,200
Seminole	6,100	6,050
East Seminole	875	850
Searight	1,725	1,700
Total Seminole	28,050	30,750
St. Louis-Pearson	17,500	17,200
Tatums-Tussy	5,125	5,050
Wewoka	1,725	1,650
Yale-Jennings	3,300	3,325
Total Oklahoma	418,250	428,100

OKLAHOMA DRILLING REPORT

Central

Creek County: Deep Rock 1 Lewis, 1,058 ft. S and 1,070 ft. E, NW cor. 16-15-7, drilling 3,398 ft.

Major Oil 1 Estate land, SE SE NW 2-17-9, drilling 1,585 ft.

Hughes County: H. G. Marshall 1 Neff, C W½ SW SE 27-5-10, drilling 1,350 ft.

Kiowa County: B. G. Walrick 1 Wayne, NE SE SE 2-7-18w, drilling 845 ft.

Logan County: Magnolia 1 Patterson, NW SE NW 29-15-1w, second Wilcox 6,077 ft., drilled to 6,081 ft. in hard white said, slight stain.

Lincoln County: Superior Oil 1 Fouquet, C NE NW 17-13-6, Woodford 4,208 ft., Hunton 4,237 ft., T.D. 4,257 ft.

Big Chief 1 Barrett, CSL SW NE 20-13-6, dense 4,380 ft., dolomite 4,390 ft., first Wilcox 4,425 ft., T.D. 4,449 ft., P.B. to 4,250 ft. to test Hunton.

Fred Haddock 1 Hert, SW NE SE 22-17-3, set 6-in. casing 4,547 ft., drilled plug and gas blew tools up the hole, making est. 2,000,000 cu. ft. of gas.

Allied Materials 2 Peck, NE SE NW 35-14-6, T.D. 4,118 ft., flowed 3 bbl. in 5 hr. and S.D.

Helmerich & Payne 1 Knox, SE SE SW 4-15-1, Big lime 4,630 ft., upper Oswego 4,670 ft., lower Oswego 4,720 ft., Mississippi lime 5,070 ft., Woodford 5,095 ft., Hunton 5,156 ft., Viola 5,374 ft., first Wilcox 5,455 ft., drilling 5,464 ft.

Okfuskee County: W. H. Allen 1 Camp, SE NE SW 18-11-10, Cromwell 3,445 ft., Mayes 3,835 ft., drilling 3,850 ft.

John Droppleman 1 Wahola, NE NE SW 15-11-10, set 5-in. 3,895 ft., to test second Wilcox 3,887 ft.

Cochran & Anderson 1 Parks, NW NW SE 30-12-8, drilling 875 ft.

Walker & Sexton 1 Hilderbrandt, NW NE NE 19-10-11, drilled by tools at 1,350 ft.

Helmerich & Payne 1-A Williams, NW NW SE 16-11-9, running pipe to test Hunton at 3,940 ft.

Oklahoma County: Harper & Turner 1 Yeager, SW SE NE 32-14-3w, drilling 5,041 ft.

Pottawatomie County: Kerlyn 1 Kirk, NW NE SW 1-8-4, drilling 150 ft.

Seminole County: Donmar Oil 1 Smith, SE SE NE 29-8-6, opened and flowed 120-bbl. head and died, acidized, would not flow, to swab.

Michaelson et al 1 Ashbrook, SW SW NW 34-10-8, first report, cored 1,564-74 ft., show oil, to drill plug.

Barnsdall 1 Baker, NE SE NE 29-11-8, rig casing 5,509-29 ft., no show, 40-qt. shot 3,509-29 ft., cleaning out with show oil.

Southern

Bryan County: Sinclair Prairie 1 Irwin, SW SE SE 18-6s-12, Oil Creek sand 1,528 ft., drilling 1,692 ft.

Caddo County: Amerada 1 Sprages, C SE NW 11-8-12w, drilling at 6,435 ft.

Denver Production 1 Sah-Cam, C SE SE 33-10-10w, old T.D. 10,084 ft., drilling 10,320 ft.

Carter County: Sinclair Prairie 1 Ingram, NW NE NW 21-4s-3w, drilling 2,668 ft.

Comanche County: Texas 1 Gamble, SW NE SE 5-3-10w, drilling 4,132 ft. in Sycamore.

Texas 1 State land, SW SE NW 13-3-10w, drilling 5,299 ft.

Texas 1 School land, C SW SW 13-4-11w, drilling 2,686 ft., Viola.

Denver Production 1 Hayes, NE NE SW 14-4-11w, drilling 1,500 ft.

Garvin County: Ohio Oil 1 Freeman, SE cor. 14-1-1w, T.D. 4,365 ft. in shale, set casing 1,705 ft. to test gas sand.

Grady County: Ray Stephens 1-A Johnston, NW NE NW 18-5-8w, drilling 2,590 ft.

Jackson County: Rhinehart Donovan 1 Petzold, SE SE NE 20-3-20w, T.D. 3,791 ft. in red beds and granite wash, fishing drill pipe.

Jefferson County: Seitz, Comegys & Seitz 1 Bound, SW SW SW 14-6s-6w, T.D. 2,011 ft., S.D.

Pontotoc County: Bob Minnick 1 Adcock, SE NW NE 21-4-6, to set pipe and test sand 1,230-54 ft.

Stephens County: C. A. Matson 2 Rowland, SW NE NE 1-3s-6w, drilling 802 ft.

Permian Basin, Panhandle Fields

(Continued from Page 85)

SOUTHEAST NEW MEXICO COMPLETIONS

Cooper, Lea County: Culbertson & Irwin 2 Cooper, 12-24-36, flowed 60 bbl. with 274,000 cu. ft. gas, shot, 3,625-46 ft.

Maljamar, Eddy County: Emperor 5-B Puckett, SE SW 34-17-32, junked at 1,770 ft. in anhydrite, rig skidded to start 5-X-B Puckett.

Shugart, Eddy County: Wilmar Oil Co. 2-B Gunsburg, NE NW 17-18-32, flowed 150 bbl., shot, 3,150-69 ft.

Vacuum, Lea County: Phillips 45 Santa Fe, 5-18-35, pumped 4 bbl. an hr., 4,340 to 4,541 ft., P.B. from 4,620 ft.

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Two New Fields Opened and Third in Prospect

By L. P. STOCKMAN

LOS ANGELES, Calif., Oct. 20.—Two new oil fields were opened up in California during the current week and another, Turnbull Canyon in the Whittier district of Los Angeles Basin, should be tanking oil within another few days. The new fields are at Helm in Fresno County and in the Jacalitos dome area of the same county. The discovery at Helm appears to be a discovery of importance because Amerada Petroleum Corp., the successful prospector, has already found three zones productive and is at present testing a fourth. This wildcat, 31-34 Clover in 34-16s-17e, was carried down into the Cretaceous at 10,257 ft. but upon finding this barren landed 5½-in. casing at 8,050 ft. and then plugged back to 8,005 ft. The 5½-in. was perforated opposite the Eocene at 7,980-8,005 ft. and the well flowed at a daily rate of 100 bbl. of clean 60.1-gravity oil through an 18/64-in. bean along with 7,000,000 cu. ft. of gas. The next interval tested was basal Miocene at 7,448-65 ft. and it showed an initial of 400 bbl. of clean 65.7-gravity oil and 9,576,000 cu. ft. of gas daily through a 50/64-in. bean. Prior to this test the hole was plugged back to 7,485 ft. Above this zone in the basal Miocene, Amerada tested an interval at 7,300-10 ft. after plugging back the hole to 7,440 ft. This second zone in the Miocene was good for 260 bbl. of very clean 65.1-gravity oil and 5,000,000 cu. ft. of gas daily through a 30/64-in. bean. Upon conclusion of this series of production tests the company begun erecting gas traps and lease storage tanks. This wildcat will be officially completed within the next week although there is no question as to the well's potential as all preliminary tests were made after the 5½-in. water string had been cemented.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: San Joaquin Valley	10	3,561	34,691
Coastal district	5	3,100	27,858
Los Angeles Basin	5	2,786	25,608
Dry holes: Wildcats	2	.....	14,113
Total	22	9,447	102,270

New Field in Jacalitos Dome Area

Wilshire-Annex Oil Co., a subsidiary of Wilshire Oil Co., independent producer, refiner and marketer, opened up a new oil field in the Jacalitos dome area of Fresno County early in the week when 33-26-E in 26-21s-15e was brought in pumping 128 bbl. of clean 39.1-gravity oil per day from the upper Temblor. This wildcat which was carried down into the Cretaceous at 6,031 ft. was plugged back previous to completion and finished producing from 3,865-3,910 ft. This well is located in an area where four dry holes were drilled previously and the test of the upper Temblor was made on the way out of the hole by Wilshire-Annex Oil Co. which was not at all certain that the 45-ft. interval would produce commercially. This 45-ft. interval is not all oil sand as the log only shows about 16 ft. of oil sand. The big question about this discovery revolves around whether any greater thickness of oil sand will be found at some other point on the structure. If this field only contains 16 ft. of oil sand it must of necessity prove to be of minor importance but on the contrary if a greater amount of oil sand is encountered its importance will be proportionately greater.

Wilshire-Annex Oil Co.'s discovery well on the Jacalitos dome is located on 640 acres of land that has been held jointly by Snowolene Oil Co., California Central Oil Co. and the Mitchell heirs of San Francisco for a long time. It was acquired through the efforts of Charles A. Son of Los Angeles in 1921 as prospecting permits which were later exchanged for a government lease. The discovery well did not show a thing below the upper Temblor zone and when drilling operations were concluded the hole was 8 ft. into the Cretaceous. Previous tests in this region included 1 Mitchell of Tide Water Associated Oil Co. which was abandoned as a duster at 6,198 ft. in 1931; Snowolene 1 Jacalitos in 22-21s-15e which was abandoned as a dry hole at 3,623 ft. in 1924; Snowolene 1-A Jacalitos in the same section which was abandoned at 4,767 ft. in 1926 and 1 Jacalitos of Jacalitos Petroleum Co. which was abandoned as unproductive at 7,265 ft. in 1938. These prior wells were located in the center of the Jacalitos anticline or to the west in contrast with the successful completion of Wilshire-Annex Oil Co. which is located in the extreme eastern end of the anticline and in the only section of the anticline that was not heretofore tested out. The question now arises: did the previous prospectors drill through the thin Temblor zone and not recognize it or deem it unworthy of a test? If this possibility is true it may mean that the remainder of the structure may be found productive but if they did not find the sand the field will probably be small. It is impossible to evaluate the importance of this discovery on the limited data available but the next well may tell a more complete story.

SAN JOAQUIN VALLEY COMPLETIONS

Coalinga Northeast, Fresno County: Standard 67-19-B fee, 19-19s-16e, flowed 1,782 bbl., 27.7-gravity, 0.4 per cent cut, 4,271,000 cu. ft. gas, 32/64-in. bean, pressures 1,377/2,875 lb., T.D. 8,207 ft., perf. 8,185-8,205 ft., gun perf. twenty ½-in. holes in liner 8,085-95 ft., completed in Gatchell zone of Eocene age.

Jacalitos, Fresno County: Wilshire-Annex Oil Co. 33-26-E Jacalitos, 26-21s-15e, pumped 128 bbl., 39.1-gravity, 0.1 per cent cut, T.D. 6,031 ft., P.B. 3,905 ft., perf. 3,865-3,910 ft., completed in upper Temblor, discovery well in new field.

Midway-Sunset, Kern County: H. & T. Oil Co. 2 Sunset, 15-31s-22e, pumped 70 bbl., 13.8-gravity, 12 per cent cut, T.D. 1,293 ft., perf. 1,023-1,293 ft., completed in Etchegoin zone A.

Mount Poso, Kern County: Ring Oil Co. 29-12 Bowles, 29-26s-28e, pumped 450 bbl., 15.8-gravity, 0.3 per cent cut, T.D. 1,727 ft., perf. 1,697-1,727 ft., completed in Vedder zone of Miocene age 1,707-27 ft.

Ring Oil Co. 6 Knapp, 28-26s-28e, pumped 35 bbl., 15.1-gravity, 1 per cent cut, T.D. 1,495 ft., perf. 1,465-95 ft., completed in Vedder zone of Miocene age, 1,481-95 ft.

Shell 18 Vedder-Rail, 9-27s-28e, pumped 200 bbl., 15.4-gravity, 10 per cent cut, T.D. 2,015 ft., perf. 1,946-2,014 ft., completed in Vedder zone of Miocene age 1,947-2,015 ft.

Shell 20 Vedder-Rail, 9-27s-28e, pumped 300 bbl., 15-2-gravity, 11 per cent cut, T.D. 1,986 ft., perf. 1,932-86 ft., completed in Vedder zone of Miocene age 1916-86 ft.

Texas 2-7 Glide, 15-27s-28e, pumped 30 bbl., 15.4-gravity, 50 per cent cut, T.D. 1,561 ft., perf. 1,500-60 ft., completed in Vedder oil sand of Miocene age 1,480-1,561 ft.

Ten Section, Kern County: Shell 77-30-A Kern County Land, 30-30s-26e, flowed 426 bbl., 37.4-gravity, 0.6 per cent cut, 534,000 cu. ft. gas, 15/64-in. bean, pressures 1,475/2,150 lb., T.D. 8,210 ft., perf. 7,991-8,046 ft., 8,056-8,206 ft., completed in Stevens oil sand of Miocene age 7,790-8,210 ft.

Suisun Wildcat district, Solano County: Standard 1 Suisun, 36-4n-2w, abandoned as unproductive; T.D. 5,440 ft., Markley shale 1,505 ft., Cretaceous 5,300 ft., formation test 2,755-2,830 ft., no blow, recovered mud only, 5,023-56 ft., recovered salt water.

Union Avenue, Kern County: Hancock Oil Co. 2 Roberts, 6-30s-28e, flowed 140 bbl., 26.5-gravity, 2 per cent cut, 700,000 cu. ft. gas, 18/64-in. bean, pressures 400/560 lb., T.D. 5,203 ft., redrilled to 4,292 ft., perf. 4,237-92 ft., this well drilled on east side of Union Avenue fault and abandoned, then redrilled and whipstocked west of fault, redrilled from 2,450 ft.

SAN JOAQUIN VALLEY OUTPOSTS

Belridge, Kern County: Belridge Oil Co. 55-26 fee, 26-27s-20e, drilling and coring 10,830 ft. in hard sand, top Eocene 9,545 ft., now below Wagonwheel of Eocene age, elev. 658 ft.

Buena Vista Hills, Kern County: Honolulu 25-P fee, 10-32s-24e, T.D. 14,622 ft., P.B. 11,059 ft., 8⅝-in. casing cemented through perfs. 8,800 ft., will test this showing, elev. 916 ft.

Standard 91-11-D fee, 11-32s-24e, grading location.

Canal, Kern County: Shell 44-14-A Kern County Land, 14-30s-25e, drilling in oil sand and shale 10,190 ft., first Vedder zone test in field, 9⅝-in. casing cemented 9,680 ft., elev. 325 ft.

Elk Hills, Kern County: Standard 24-19-R fee, 19-30s-23e, drilling 2,897 ft. in shale.

Standard 62-31-S fee, 31-30s-24e, drilling 4,860 ft. in sand and shale, elev. 1,220 ft.

Standard 45-19-S fee, 19-30s-24e, drilling 10,860 ft. in sand and shale, elev. 707 ft.

Greeley, South, Kern County: A. N. Macrate 1 Haberfeld, 32-29s-26e, drilling 10,635 ft. in sand and shale, top Stevens zone of Miocene age 8,090 ft., looking for Vedder, elev. 338 ft.

Kern Front, Kern County: Richfield 1 Kraemer, 34-28s-27e, drilling 4,296 ft. in sand.

Kettleman North Dome, Kings County: Standard 1-1-U fee, 1-23s-18e, T.D. 12,884 ft. in hard gray sand, showing considerable gas, redrilled to 11,640 ft., tested wet, recemented, testing, elev. 693 ft.

Midway-Sunset, Kern County: North Amer. Oil Consd. 1-28 W.P., 28-32s-23e, drilling 9,770 ft. in sandy shale, elev. 1,560 ft.

Mountain View, Kern County: Hogan Pet. Co. 1-A Bahrenburg, 32-30s-29e, drilling 5,298 ft. in sand and shale, will be deep test.

Mount Poso, Kern County: Bishop, Bradford 1 Poso, 22-27s-28e, drilling 1,434 ft. in oil sand and shale, will cement casing and test.

Paloma, Kern County: Western Gulf 12-7 Symons, 7-32s-27e, drilling 10,790 ft. in Pliocene sand, most easterly well in field, elev. 288 ft.

Raisin City, Fresno County: Bandini Pet. 82-23 S.P., 23-15s-17e, drilling in sand 1,162 ft.

Seaboard Oil Corp. 88-13 S.T.U., 13-15s-17e, drilling 5,122 ft. in oil sand and shale.

Rio Bravo, Kern County: Union 21-33 Pacific States, 33-28e-26e, drilling 13,498 ft. in Eocene sand below Vedder zone of Miocene age, elev. 330 ft.

SAN JOAQUIN VALLEY WILDCATS

Altamont district, Alameda County: Shell 1 Nissen, 7-2s-3e, drilling 5,930 ft. in hard sand, elev. 1,023 ft.

Belridge district, Kern County: Sec. 27 Oil Co. 1 Aslin, 27-28s-22e, drilling 1,380 ft. in sand.

Chowchilla district, Madera County: Shell 74-9 Chowchilla Farms, 9-11s-14w, drilling 9,060 ft. in sand and shale, no showings to date.

Delano district, Kern County: Shell 52-21 Bell, 21-25s-28e, drilling 5,592 ft. in sand and shale, elev. 406 ft.

Helm district, Fresno County: Amerada 31-34 Clover, 34-16s-17e, T.D. 10,257 ft., P.B. 8,005 ft., one Eocene zone and two Miocene zones already found productive, now testing third Miocene zone.

Kerman district, Fresno County: S. B. Herndon 1 Bottoms, 3-14s-16e, drilling in sand 4,202 ft., elev. 187 ft.

McDonald Anticline district, Kern County: Texas 1 Anderson, 19-28s-20e, drilling 4,951 ft. in sand and shale, elev. 1,080 ft.

Rio Vista district, Solano County: Standard 1 Bradford, 20-3n-3e, drilling 4,350 ft. in gas sand, P.B. 4,226 ft., elev. 5 ft.

Standard 1 Productive Properties, 23-3n-3e, drilling 5,370 ft. in sandy shale, elev. 5 ft.

Amerada Pet. 1 Robinson, 4-4n-2e, drilling 4,198 ft. in sand.

Rumsey Hills district, Yolo County: Standard 1-1 Tippetts, 15-12n-3w, drilling in sand 2,640 ft., elev. 1,480 ft.

Shafter district, Kern County: General Pet. 51-15 S.P., 15-28s-24e, drilling 9,090 ft. in sand and shale.

Shale Hills district, Kern County: H. C. Morton 1 Core hole, 30-26s-19e, T.D. 2,205 ft. in shale and oil sand, P.B. 1,000 ft.

Tideland Oil Co. 1 Grant, 4-27s-18e, rigging up.

Turnbull Canyon Discovery Well Expected to Make Good Pumper

Continental Oil Co. at the close of the current week was cleaning out its Turnbull Canyon wildcat in the Whittier district of Los Angeles County and was preparing to run in tubing and put the well on the beam. This wildcat which expected to open up a new field in the Turnbull Canyon district is bottomed at 3,447 ft. with a cement job through perforations at 3,373 ft. This gives the well 74 ft. of formation from which to produce and while it is not all oil sand good porosity and permeability make up for this. Continental has bailed and swabbed this well for several days but failed to stimulate it enough to kick over and so the decision was made to install pumping equipment. Oil recovered from the hole tests 25.9 gravity and was practically clean. This wildcat was located as a result of surface geology followed by a seismograph survey that confirmed preliminary findings and indicated good closure. It was impossible to determine the degree of closure from surface work but the seismograph removed all doubt. Roy Barnes, chief geologist, and his staff have done a fine piece of work in the Turnbull Canyon area as even a normal pumping well will be commercially profitable due to the relatively shallow depth at which production is expected. A check of acreage in the area indicates the probability that other operators will be able to develop production if Continental is successful in completing its present well although Continental holds by far the greater part of potentially productive acreage.

Flowing Well Completed in Sentous Zone at Inglewood

Standard Oil Co. finished its first Miocene zone completion in the Inglewood field of Los Angeles Basin early this week when 2-13 Vickers was brought in flowing 1,154 bbl. of 25.2-gravity oil per day from 8,401 ft. and should follow up this success within the next several days by finishing 2-12 Vickers which is in oil sand and has 7-in. casing cemented at 7,770 ft. These wells are being drilled by Rocky Mountain Drilling Co. which was very successful in deep drilling for Standard Oil Co. in the Wasco field of Kern

County. R. R. Bush Oil Co. started Miocene drilling in the Inglewood field by completing a small well in the southwestern end of the field and then moved northwest to finish drilling operations on Federal Oil Co.'s initial well in the extreme northwestern end of the field. It is still too early to venture an opinion as to whether the Sentous zone of Miocene age underlies the present productive limits of the field as outlined by Pliocene production but it is assumed to do so. Bush and Standard Oil Co. found the Sentous zone far out on the structure in the extreme southwestern end of the field and even though the zone at this point was very tight the fact remains that it was found. Structurally higher it might not be so tight.

AVERAGE DAILY PRODUCTION

	Oct. 18	Oct.11
Wilmington	88,450	88,075
Midway-Sunset	48,950	55,250
Coalinga	44,800	43,750
Kettleman North Dome	40,500	38,250
Long Beach	38,125	38,725
Ventura Avenue	37,875	36,975
Huntington Beach	33,050	30,950
Dominguez	24,025	23,650
Santa Fe Springs	22,850	22,840
Santa Maria Valley	20,875	20,825

LOS ANGELES BASIN COMPLETIONS

Dominguez, Los Angeles County: Union 84 Callender, 32-3s-13w, flowed 720 bbl., 31.2-gravity, 0.3 per cent cut, 2,262,000 cu. ft. gas, 56/64-in. bean, pressures 300/750 lb., T.D. 7,075 ft., perf. 6,973-7,073 ft., completed in Seventh Callender zone of Miocene age.

Huntington Beach, Orange County: Signal O. & G. Co. 32-B Bolsa, 33-5s-11w, flowed 195 bbl., 20.1-gravity, 3 per cent cut, 42/64-in. bean, T.D. 2,910 ft., perf. 1,950-2,435 ft., 2,735-70 ft., 2,800-80 ft., completed in Bolsa zone of Pliocene age.

Inglewood, Los Angeles County: R. R. Bush Oil Co. 1 Smith, 7-2s-14w, abandoned as dry hole, T.D. 8,673 ft., P.B. 8,170 ft., top Miocene 7,450 ft., top Nodular shale 8,100 ft., swabbed salt water with a little oil and gas.

Standard 2-13 Vickers, 7-2s-14w, flowed 1,154 bbl., 23.6-gravity, 7 per cent cut, 880,000 cu. ft. gas, 32/64-in. bean, pressures 150/700 lb., T.D. 8,401 ft., perf. 8,103-8,375 ft., completed in Sentous zone of Miocene age.

Wilmington, Los Angeles County: Union Pacific R. R. 202 fee, 4-5s-13w, flowed 395 bbl., 20.2-gravity, 0.1 per cent cut, 32/64-in. bean, pressures 500/600 lb., T.D. 3,555 ft., perf. 2,804-67 ft., 2,887-2,908 ft., 2,925-3,003 ft., 3,237-3,351 ft., 3,391-3,501 ft., 3,520-48 ft., completed in Ranger and Terminal zones.

Union Pacific R. R. 203 fee, 9-5s-13w, flowed 322 bbl., 16.3-gravity, 1.7 per cent cut, 38/64-in. bean, pressures 150/180 lb., T.D. 3,667 ft., perf. 2,949-3,022 ft., 3,033-3,106 ft., 3,130-3,205 ft., 3,454-3,578 ft., 3,615-60 ft., completed in Ranger zone.

LOS ANGELES BASIN OUTPOSTS OR DEEP TESTS

Dominguez, Los Angeles County: Decker and Associates 1 Frome, 29-3s-13w, drilling 7,268 ft. in oil sand, 7-in. casing cemented 7,247 ft.

Inglewood, Los Angeles County: Federal Oil Co. 2 Smith, 7-2s-14w, T.D. 8,184 ft., redrilling 8,190 ft.

Hogan Pet. Co. 3-A Machado, 7-2s-14w, drilling 7,777 ft. in sand and shale.

Jergins Oil Co. 2 Howard, 7-2s-14w, drilling 8,420 ft. in oil sand and shale.

Standard 2-12 Vickers, 7-2s-14w, drilling 8,147 ft. in oil sand and shale, Nodular shale 7,740 ft., almost got away while pulling tester.

Texas 8 Smith, 7-2s-14w, drilling 8,412 ft. in oil sand, top Nodular 7,840 ft., will redrill, elev. 242 ft.

Tide Water Associated 71 Vickers, 7-2s-14w, material on ground.

Tide Water Associated 72 Vickers, 7-2s-14w, rigging up.

Potrero, Los Angeles County: Tide Water Associated 5 Cypress, 34-2s-14w, rigged up.

Torrance, Los Angeles County: Jergins Oil Co. 1 Dominguez, 5-4s-14w, drilling 3,140 ft. in sand and shale.

LOS ANGELES BASIN WILDCATS

La Mirado district, Orange County: Texas 1-A McNally, 22-3s-10w, drilling 8,950 ft. in sand and shale, elev. 112 ft.

Palos Verdes district, Los Angeles County: Newton Dev. Co. 1 P.V., 13-5s-15w, drilling 3,870 ft. in hard sand, possibly volcanics.

Puente district, Orange County: Sunset Oil Co. 1 Baldwin, 11-2s-11w, T. D. 4,681 ft. in hard gray sand and black shale with streaks of conglomerate and oil sand, top Kraemer shale 3,888 ft., formation test 4,395-4,437 ft. tested wet, will plug back and reperforate.

L. J. Altchuler 1 Larry, 30-2s-9w, drilling 1,250 ft. in brown shale and gray sand, bailer sample showed little oil.

J. F. Kosanke 1 Puente, 24-2s-10w, drilling in sand and shale 1,823 ft., swabbing water with scum of oil.

Rio Hondo district, Los Angeles County: Potrero Oil Co. 1 Newman, 32-1s-11w, rigged up, located 1 mile north of eastern tip of Montebello field.

Seal Beach, Orange County: South Basin Oil Co. 1 Heller, 6-5s-11w, drilling 6,770 ft. in Repetto sand, is joint test of South Basin Oil Co., Johnston Drilling Co. and Allied Pet. Co.

Whittier district, Los Angeles County: Continental Oil Co. 1 Turnbull, 13-2s-11w, T.D. 3,447 ft. in sand and shale, 7-in. casing cemented 3,270 ft., formation tests: packer 2,341 ft., recovered fresh water; 2,884-3,068 ft., recovered 12 stands mud, 4 stands mud and water, and 43 stands fresh water; 3,270-3,340 ft., recovered 1,700 ft. of 20-gravity oil; 3,366-3,447 ft., recovered 1,800 ft. of 22-gravity oil and 160 ft. of water, swabbing 22-gravity oil, will put on beam, elev. 535 ft.

Los Nietos Valley Oil Co. 1 Los Nietos, 29-2s-11w, rigged up.

Pico Anticline Test Shows Nothing

The most startling upset in the Coastal district during the week to many, and not so much of an upset to numerous others, was the utter failure of Aztec Oil Co.'s wildcat on the Pico anticline to show anything at all except 6,113 ft. of hole. Interpretation of the electric survey appears to have caused the operator to expect production of oil and gas although there are a number of other features that are somewhat puzzling. Aztec is making arrangements to resume work and in the meantime is attempting to correlate the log of this well with others in the general area. It still remains to be determined what caused the major resistance, far in excess of fresh water, in the survey.

Rincon Deep Well Ready for Test

Chanslor-Canfield Midway Oil Co. is making preparations to test out 3-C Hobson in the Rincon field of Ventura County and much depends upon the outcome of present work. This well is the deepest drilled hole in the Rincon field and consequently much depends upon how much production it shows. It is generally agreed because of the large penetration that some production will be developed but as to quantity that is another matter. Much of the oil sand drilled through has been very tight and lacks favorable porosity and permeability. No. 3-C Hobson is bottomed in tight oil sand at 10,515 ft. and 7-in. casing has been cemented at 9,048 ft. It is the present intention to test out the zone by stages and with this in mind the upper part of the zone will be tested first. The company's 9-C Hobson is indicative of the tightness of the oil sand as this well bottomed at 9,300 ft. and producing from 591 ft. of oil sand is only good for 111 bbl. per day on a flow by heads. Well 3-C Hobson on the other hand has blanked off the top portion of the zone producing in 9-C Hodson. This deep drilling work may mean the starting of a deepening campaign by other operators or it may mean a disregard for

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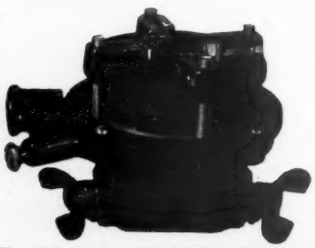

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deep zone possibilities as a 100 bbl. well at 9,300 ft. or deeper does not offer any inductment to engage in deeper exploitation. Because of this, the outcome of deep drilling on 3-C Hobson will be watched with considerable interest, especially by those operators holding potentially productive acreage at Rincon.

COASTAL DISTRICT COMPLETIONS

Del Valle, Los Angeles County: R. E. Havenstrite 1 Barnes, 16-4n-17w, flowed 735 bbl., 27.5-gravity, 15 per cent cut, 800,000 cu. ft. gas, 30/64-in. bean, pressures 200/500 lb., T.D. 6,020 ft., cleaned out to 6,014 ft., perf. 160 shots 5,955-6,014 ft., completed in Modelo zone of Miocene age.

Santa Maria Valley, Santa Barbara County: Hancock & Bush 3 Wylie, 30-10n-33w, flowed 400 bbl., 15.1-gravity, 30 per cent cut, 48/64-in. bean, pressures 150/250 lb., T.D. 4,798 ft., perf. 4,080-4,739 ft., completed in Santa Maria Valley zone.

Union 7 Le Roy, 14-10n-35w, pumped 439 bbl., 17.4-gravity, 12 per cent cut, T.D. 5,504 ft., P.B. 5,223 ft., perf. 4,878-5,222 ft., completed in Monterey, bottomed in Franciscan basement 5,498-5,504 ft.

Union 7 Vincent, 25-10n-34w, flowed 1,451 bbl., 17.4-gravity, 1.1 per cent cut, 64/64-in. bean, pressures 150/250 lb., T.D. 4,543 ft., perf. 3,600-4,541 ft., completed in Monterey, bottomed in Santa Maria siltstone.

Ventura Avenue, Ventura County: Bolsa Chica Oil Co. 7-A Bolsa, 22-3n-23w, flowed 75 bbl., 32.2-gravity, 4.8 per cent cut, 142,000 cu. ft. gas, 15/64-in. bean, pressures 100/950 lb., T.D. 7,280 ft., perf. 7,134-7,279 ft., gun perf. 7,015-90 ft., 7,115-20 ft., completed in Zone C.

Shell 105 Taylor, 29-3n-23w, flowed 1,014 bbl., 31.1-gravity, 3 per cent cut, 2,350,000 cu. ft. gas, 32/64 in. bean, pressures 1,150/1,375 lb., T.D. 7,257 ft., perf. 6,728-6,890 ft., 6,933-7,254 ft., gun perf. 6,060-6,160 ft., 6,190-6,290 ft., 6,340-6,440 ft., 6,470-6,525 ft., 6,540-6,700 ft.

COASTAL DISTRICT WILDCATS

Aliso Canyon district, Los Angeles County: Associated 1 Mission, 26-3n-16w, T.D. 5,490 ft. in gray sand, reaming, elev. 2,709 ft.

Castaic district, Los Angeles County: Texas 1 Fernando, 11-4s-17w, rigging up.

Cat Canyon district, Santa Barbara County: A. E. Bell 1 Gilmore, 23-9n-33w, T.D. 6,095 ft., will cement 7-in. casing at 4,930 ft. and make production test.

Standard 3 Los Flores, 27-9n-33w, drilling in sand and sticky shale 5,505 ft., elev. 1,065 ft.

Union 12 Bell, 27-9n-33w, rig, is offset to Standard 2 Los Flores.

Camulos Ranch, Ventura County: Western Gulf 1 Rubel, 22-4n-18w, drilling in sand and shale 6,392 ft., elev. 750 ft.

Chatsworth district, Los Angeles County: Imperial Oil Co. 1 Chatsworth, 25-2n-17w, rig.

Del Valle district, Los Angeles County: Bankline Oil Co. 1 Videgain, 17-4n-17w, drilling 7,700 ft. in shale and oil sand, top Miocene 5,856 ft., elev. 1,719 ft.

Elwood district, Santa Barbara County: Barnsdall-Richfield 88-11 State, tideland, drilling 6,391 ft in Sespe oil sand, completing, elev. 21 ft.

Loma Grande district, Monterey County: Loma Grande Oil Co. 1 Corey, 23-24s-10e, T.D. 3,790 ft. in shale, fishing drill collar and bit, elev. 1,500 ft.

Newhall district, Los Angeles County: Aztec Oil Co. 1 Sanborn, 6-3n-16w, T.D. 6,113 ft. in Miocene oil sand and sandy shale, on production test swabbed dry, elev. 1,516 ft.

R. W. Young 1 Walker, 11-4n-16w, drilling 5,160 ft. in hard gray sand and shale, had oil and gas shows on ditch, elev. 1,254 ft.

Oak Canyon district, Los Angeles County: Western Gulf 1 Wickham, 31-5n-17w, drilling 4,381 ft. in sand, elev. 1,916 ft.

Hathaway Co. 2 Ram, 31-5n-17w, drilling 6,200 ft. in sand and shale.

Rincon district, Ventura County: C.C.M.O. Co. 3-C Hobson, 17-3n-24w, drilling 10,515 ft. in hard tight oil sand and shale, cemented 7-in. casing 9,048 ft., elev. 245 ft.

Towsley Canyon district, Los Angeles County: Barnsdall and Ambassador Pet. 1 Limebocker, 17-3n-18w, drilling 3,165 ft. in hard sand and shale, showing 45° dips, elev. 1,680 ft.

Kentucky Fields

(Continued from Page 78)

5324 Aaron Justice, Lower Pompey Branch, 2,203 ft., lime.
5334 James W. Bevins, Slone Branch, 1,175 ft., sand.
5351 William Ford, Ford Branch, 1,086 ft., sand.
5352 Vonie Swinney, Long Branch, 1,230 ft., sand.
5354 J. W. Maynard, Johns Creek, 334 ft., sand.
5361 W. H. Burchett, Johns Creek, 10 ft., spudding.
5363 Winston G. Stratton, Shop Branch of Mare Creek, set machine.

WESTERN KENTUCKY COMPLETIONS

Daviess County

Utica district: Baldwin Oil 7 A. A. Westerfield, dry, T.D. 1,745 ft.

Ohio County

Easton district: Batton & Vickers 1 Chester Huff, dry, T.D. 274 ft.

Pleasant Ridge district: W. Wilkins et al 4 E. K. Moseley, dry, T.D. 1,097 ft.

Union County

Boxville district: Toombs & Smith 1 C. B. Waller, dry, T.D. 732 ft.

TEXAS GULF COAST

Wildcat South of Rowan Ready For Test in Upper Frio Sand

By NEIL WILLIAMS

HOUSTON, Tex., Oct. 20.—Interest in the Texas Gulf Coast district at the close of the week was shifted to Brazoria County where preparations were being made to test Humble 1 Houston Farm Development Co., a wildcat located south of the Rowan field in the Perry & Austin Survey, Abstract 108. Total depth of the well is 7,232 ft., and casing is being cemented for testing after an electrical survey and sidewall cores showed promise of production in two sand sections, in the Frio at 6,800 ft., and 7,165 ft. The well is located on a block of several thousand acres which was leased on the strength of geophysical work, and the sands to be tested are believed to be in the upper section of the Frio which is in contrast to the most recent development in which most of the production has been found in the basal section of the formation. Should the well fail to produce from the upper sands it is very likely that the well will be drilled deeper.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	16	4,146	97,433
Dry holes: Wildcats	4	.....	24,491
Total	20	.....	121,924

Big Hill Outpost Tries to Blow Out

Stanolind 1 George D. Anderson, a projected 15,000-ft. test located on the northwest flank of the old Big Hill dome, Jefferson County, was being watched with considerable interest as the well attempted to blow out while drilling at 7,042 ft. An electrical survey, made from 6,250-7,034 ft., was followed up by a series of sidewall cores, but details as to what was found was not released. The company is conditioning mud preparatory to drilling deeper. Big Hill has been looked upon for a number of years as a potential oil field, and numerous attempts have been made to develop commercial production, but all have failed due to high gas pressure and a thick section of heaving shale which resulted in mechanical trouble and ultimate abandonment.

Hull Production Extended in New Sand

In Liberty County, and located on the northwest flank of the old Hull field, Gulf Production Co. extended production about 1,500 ft. east and opened a new sand with the completion of 1 Thomas fee. With the hole bottomed at 6,259 ft., casing was perforated at 5,700-30 ft., 5,852-70 ft., and 5,818-28 ft., and the well flowed 627 bbl. of oil daily through ¼-in. choke. The completion opens the way for further development on the entire north flank of the structure which originally started on the extreme northwest flank by a new sand discovery made by Republic Production Co.

Martha Extended

In the same county, and located in the Martha field, Stanolind Oil & Gas Co. was extending production several hundred feet as 7-A Seaberg showed for a producer on a drill-stem test. Five and one-half inch casing was cemented on bottom at 8,250 ft. after two drill-stem tests at 8,173-89 ft. and 8,215-20 ft., recovered 210 ft. of pipe-line oil.

Lower Wilcox Test at Segno Plugged Back to Cockfield Gas Pay

On the south side of the Segno field, Polk County, Gulf Oil Corp. gave up its attempt to complete 48 Wing as a producer in the lower Wilcox, and the well has been completed as a gas well in the upper Cockfield sand at 5,360-70 ft. This well was originally drilled to a total depth of 11,743 ft., and casing was cemented for testing in the lower Wilcox after an electrical survey showed possible production. The last test made before the hole was plugged back was at 10,049-10,321 ft., and 8,480 ft. of gas-cut mud was recovered.

Wilcox Trend Developments

In the Goodrich area, Polk County, Pan American 1 Goodrich Community, A. Viesca Survey, was drilling ahead after a drill-stem test in the Cockfield sand at 3,994 ft., recovered 3 stands of oil and gas-cut mud and 14 stands of salt water. The well is located a short distance from the same company's 1 Texas Long Leaf Lumber Co., located in the same survey, which is preparing to sidetrack at 9,571 ft., after plugging back from a total depth of 9,966 ft.

Another Wilcox test attracting attention is Republic Production Co. 1 Smith, located west of the Joe's Lake field, Tyler County. A 2-minute drill-stem test at 7,636-50 ft., tested no working pressure and 90 ft. of salt water. The well was cored ahead, topping sand and sandy shale with a show of oil at 7,685 ft., and the section was cored to a total depth of 7,694 ft., where a drill-stem test was scheduled to be made. The well is situated in the H. M. Smith Survey, and the sand section correlates with the Wilcox producing horizon of the Joe's Lake field.

In the Texana field Jackson County, Sinclair Prairie Oil Co. is moving in material for 1 A. E. Westhoff and A. A. Egg. Location is the E. McNutt Survey, about 2,500 ft. northwest of the company's 1 Volkner. The latter well was completed several weeks ago at 5,200 ft. to open the first oil production in this gas-distillate field. To the east of this field, and located as a north offset to the discovery well of the North La Ward field, Moore & Ahren were cementing casing in 1 Oslocsky at 5,225 ft., after coring the discovery pay about flat with the discovery well. In the meantime, Magnolia Petroleum Co. announced locations for three wells to be drilled on the Gordon tract, offsetting the discovery well to the west.

TEXAS GULF COAST COMPLETIONS

Wildcats

Brazoria County: Pure 1 T. L. Smith, dry, T.D. 8,626 ft.

Fayette County: M. H. Miller 1 J. A. Kerry, dry, T.D. 3,331 ft.

Harris County: Grubb & Hawkins 1 Buxbaum, top Cockfield 6,242 ft., discorbis Yeguaensis 6,228 ft., dry, T.D. 6,517 ft.

Jackson County: J. G. Mayo 1 First National Bank of Commerce, dry, T.D. 6,017 ft.

Fields

Conroe, Montgomery County: J. Blaffer 1 O. C. Bailey, 422 bbl., ¼-in. choke, perf. casing 5,064-08 ft. T.D. 5,092 ft.

Dyersdale, Harris County: H. C. Cockburn 14 Burkett, 203 bbl., ¼-in. choke, T.D. 4,077 ft.

Fannett, Jefferson County: Gulf 12 P. E. Bordages, 669 bbl., ¼-in. choke, perf. casing 8,288-94 ft., T.D. 8,335 ft.

Hull, Liberty County: Gulf 1 Thomas fee, 627 bbl., ¼-in. choke, perf. casing 5,700-30 ft., 5,818-28 ft., 5,852-70 ft., T.D. 6,259 ft.

Lolita, Jackson County: Humble 20-A L. Ranch, 280 bbl., ¼-in. choke, perf. casing 5,926-29 ft., T.D. 6,407 ft.

Magnolia 29 Mitchell, 149 bbl., 9/64-in. choke, sand 5,941-43 ft.

Magnet, Wharton County: Humble 49 Cockburn, 32 bbl. 12 hr., ⅛-in. choke, T.D. 5,535 ft.

Maurbro, Jackson County: Humble 1 C. C. Bonnett, 400 bbl., ¼-in. choke, sand 5,230-42 ft.

North La Ward, Jackson County: Christie & Dunnam 1 J. E. Pickering, 216 bbl., 11/64-in. choke, perf. casing 5,210-18 ft., T.D. 5,228 ft.

North Markham, Matagorda County: Ohio 11 J. Carlson, 184 bbl., ⅛-in. choke, perf. casing 7,716-17 ft., T.D. 7,920 ft.

Old Ocean, Brazoria County: Harrison & Abercrombie 10 Bernard River Land Co., 415 bbl., ¼-in. choke, top sand 10,040 ft., T.D. 10,859 ft.

Pierce Junction, Harris County: Hamill & Smith 4 Bender, 212 bbl., 12/64-in. choke, T.D. 3,233 ft.

West Ganado, Jackson County: Pure Oil Co. 5 Spacek, 110 bbl., ⅛-in. choke, perf. casing 4,736-55 ft., T.D. 5,501 ft.

L. Crouch 1 State, 128 bbl., ¼-in. choke, perf. casing 5,468-71 ft., T.D. 5,507 ft.

Magnolia 199-A West ranch, 122 bbl., 7/64-in. choke, perf. casing 5,746-54 ft., T.D. 5,761 ft.

Withers, Wharton County: F. W. Michaux 5-A Pierce, 130 bbl., 5/32-in. choke, perf. casing 5,368-74 ft., T.D. 7,534 ft.

TEXAS GULF COAST DRILLING REPORT

Austin County: Woodley 1 Polschak, S. F. Austin Sur., S.D. 6,862 ft.

Brazoria County: H. E. Hamilton 1 J. M. Smith, J. Hall Sur., drilling shale 3,916 ft.

Humble 1 Colley, J. M. O'Donnell Sur., drilling shale 8,196 ft.

Humble 1 Houston Farm Development Co., Perry & Austin Sur., T.D. 7,232 ft., cutting side-wall cores.

H. A. Potter et al 1 McDonald, W. D. C. Hall Sur., drilling shale 4,001 ft.

Sterling 1 Shanks, J. Brown Sur., T.D. 8,643 ft., D.S. stuck.

Skelly 1 Vieman, J. White Sur., T.D. 9,964 ft., running electrical survey.

Fort Bend County: Jack Frazier 1 Mason & Briscoe, J. Foster Sur., top Textularia Warreni 5,276 ft., Marginulina Cocoaensis 5,914 ft., Hockleyensis 5,975 ft., drilling shale 6,950 ft.

Providence 1 Hruzek, G. Borden Sur., drilling shale 8,480 ft.

Harris County: Ralph Johnston 1 Cockburn, J. Jeffries Sur., drilling shale 7,117 ft.

Jackson County: J. L. Collins 1 Calloway, J. J. Linn Sur., 10¾-in. casing 587 ft.

Lavaca County: Normandie Oil Co. 1 J. Smolik, M. Caldwell Sur., drilling shale 7,354 ft.

Wharton County: Amerada 1 Wigington, E.T.R.R. Sur., Sec. 89, top small Discorbis 5,167 ft., large Discorbis 5,198 ft., Heterostegina 5,384 ft., drilling shale 7,017 ft.

Wynn Crosby 1 William Poole, A. J. Fry Sur., Sec. 16, T.D. 9,115 ft., P.B. 8,735 ft., sidetracked 8,735 ft., drilling shale 9,231 ft.

Illinois Fields

(Continued from Page 77)

Rising Sun, White County: First Nat. Pet. Trust 4 F. Karch, NE SW NE 24-6s-10e, pumped 160 bbl., 50-qt. shot 2,050-60 ft., Palestine sand 2,041-60 ft., T.D. 2,060 ft.

Cherry & Kidd et al 6 H. Karch, NE NW SE 13-6s-10e, pumped 230 bbl., 20-qt. shot 2,005-15 ft., Palestine sand 1,999 ft., T.D. 2,015 ft.

Roland, White County: Carter 1 J. S. Carroll, SW NW NW 11-7s-8e, dry at 2,940 ft., P.B. 2,660 ft., lower Kincaid 1,876 ft., Menard 2,096 ft., Waltersburg 2,205 ft., Vienna 2,240 ft., Tar Springs 2,285 ft., Glen Dean 2,386 ft., Barlow 2,603 ft., Cypress sand 2,618 ft., Benoist 2,795 ft., Renault 2,830 ft., Aux Vases 2,851 ft.

Arail-Lambert 2-A Mitchell, SE NW SW 11-7s-8e, location abandoned.

Rural Hill, Hamilton County: Shell 4 W. W. Daily, SE SE NE 12-6s-5e, pumped 120 bbl., 15-qt. shot 3,015-30 ft., Aux Vases 2,988 ft., pay 3,015-30 ft., T.D. 3,039 ft.

Reward et al 1 Smith-Knight, NE NW NE 13-6s-5e, flowed 525 bbl., 50-qt. shot 3,073-93 ft., Aux Vases 3,064-89 ft., T.D. 3,320 ft.

Stokes, White County: Pure-Carter 1 Austin Consol., NW NW NW 17-6s-9e, pumped 174 bbl. oil and 11 bbl. water, 20-qt. shot 2,819-27 ft., Benoist sand 2,813-27 ft., T.D. 2,827 ft.

Westfield, Clark County: George Haley 2 C. Christian, NW SW SW 19-11n-14w, 10,000 cu. ft. gas, lime 290-97 ft., sand 297 ft., T.D. 304 ft.

Woodlawn, Jefferson County: McBride 8 Hoppa, SW SE NE 2-3s-1e, pumped 460 bbl., 60-qt. shot 1,913-44 ft., Benoist 1,913 ft., T.D. 1,945 ft.

McBride 7 Hoppa, SE SE NE 2-3s-1e, pumped 480 bbl., 50-qt. shot 1,915-40 ft., Benoist 1,906 ft., T.D. 1,940 ft.

Magnolia 1 Walker et al, NE NW SE 2-3s-1e, pumped 216 bbl., 40-qt. shot 1,945-58 ft., Benoist 1,933 ft. T.D. 1,960 ft.

Magnolia 5 L. Oslager, E½ NE SW NW 1-3s-1e, pumped 360 bbl., 50-qt. shot 1,954-70 ft., Benoist 1,944 ft., T.D. 1,970 ft.

Texas 3 A. Trautt, SE SW NW 36-2s-1e, pumped 769 bbl., 5-qt. shot 1,991-94 ft., Benoist 1,987-93 ft., T.D. 1,994 ft.

Texas 2 I. N. Wood, SW SE SE 36-2s-1e, pumped 35 bbl. in 15 hr., natural, Benoist 1,998-2,006 ft., T.D 2,006 ft.

Olla, South Olla and Little Creek Could Link

(Continued from Page 70)

post for the Olla field proper which stands as a link between the two.

There are no dry holes between the Olla and the South Olla fields and it is more than probable that future drilling will link these two areas. Only 2½ miles west and slightly south of the edge of the South Olla field is the north end of the increasingly active Little Creek field. There are no defining failures between the South Olla and the Little Creek fields, but the one deep Gulf wildcat failure southwest of Olla proper discourages, partially, the possibilities of linking those areas. It is more than probable that some extremely lean if not barren spots will later develop in the Wilcox zone and for this reason the Gulf failure may not be a definite obstacle to linking Olla proper and Little Creek.

Drilling continues in these three fields of La Salle at a rate not exceeded by any other district in the state. Costly completion problems are gradually being overcome through the cooperative work of the acidization and cementing companies operating in the area. It has been estimated for some time that half of the total cost of finishing a well in this area was absorbed in the actual completion processes after the hole had reached the producing sand. This completion cost is gradually being reduced.

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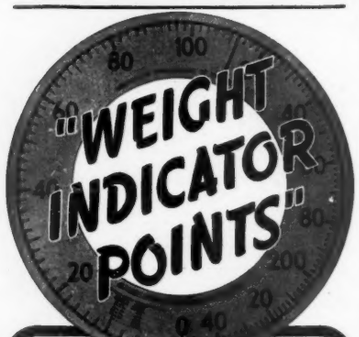

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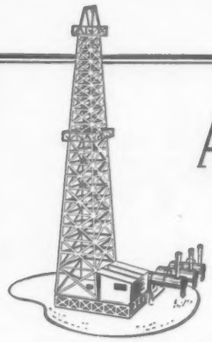

Among the Drilling

Contractors Protest Ruling Capitalizing Intangibles

A RECENT ruling of the Internal Revenue Department holding that costs of wells drilled on footage-contract basis can no longer be considered as intangible writeoffs against income confronts drilling contractors with a problem that is now drawing attention of the American Association of Oilwell Drilling Contractors.

The new ruling, if allowed to stand, according to the analysis of the contractors' association, may influence the use of more company tools in drilling operations.

Under former rulings, all expense items (intangibles) were subject to writeoffs against income. This practice permitted the oil companies using drilling contractors to capitalize such permanent items as casing and well-head connections and to charge to expense such items as labor and miscellaneous intangibles.

Under the new ruling the Government virtually considers the well completed under contract and turned over to the owner as one capital item. No provision whatever is made for intangibles. Drilling already done this year and drilling now contracted are likewise affected.

The latest ruling is a dangerous interpretation of an old law that has permitted the drilling contractor to operate fairly and successfully on a footage-contract basis, which is the only type contract under which most operators will drill wells.

Drilling contractors are seeking to nullify this ruling and restore the old interpretation of tax laws.

OIL WELL Drilling Co., Dallas, Tex., has staked location for a wildcat test in the central part of Ector County, Texas. It will be 1 J. L. Johnson, 467 ft. from the north and west lines of Section 48, Block 44, T-1s, T.&P. Survey. Location is on farmout acreage from the Shell Oil Co., Inc.

O. C. MEYERS, Wewoka, Okla., will drill a Hunton lime or Cromwell sand test for Charles F. Newsom, Oklahoma City independent, and associates, in Okfuskee County, Oklahoma. The test will be known as Newsom et al 1 Winship, SE SE SW 12-11-8, east of the Dill pool.

O. T. CLARK, Clarksville, Tex., has derrick built for Alex M. Snyder 1 Edmondson heirs, a wildcat on a block of 2,500 acres east of Woodland, Tex., in Red River County, Texas, for which he has the contract.

BIG WEST Drilling Co., Kilgore, Tex., who drilled Grady Vaughn 1 Frost Lumber Industries, John Buckley Survey, in the Arcadia community of Shelby County, Texas, are reportedly ready to deepen the test from its present 6,770 ft. to 8,500 ft.

MARTIN THOMPSON, Houston, Tex., has contract and is drilling a wildcat on what is known as the Dunning structure in Gonzales County, Texas, near the community of Terryville, 432 ft. out of the south corner in the Joe Dillard Survey for Randon Production Co.

SHIELDS & SHIRLEY Drilling Co. has the contract to drill L. & S. Drilling Co. 1 E. Cox, SE SE SE 18-14n-5w, Isabella County, Michigan.

GORDON Oil Co., Mount Pleasant, Mich., has the contract to drill Bolger Oil Co. 1 George Sweet, S½ NE NE 20-18n-10w, Osceola County, Michigan.

EUGENE HILLIARD has contracts for Ohio Oil Co. 2-A State, S½ NE SE 33-21n-3w, Roscommon County, Michigan, and an offset for the same company in N½ NE SE 33-21n-3w.

J. C. COOK, Arp, Tex., is rigging up for Hinchcliff & Smith 2 Joe Gilmore, a Sun Oil farmout on a 90-acre tract in the Nathan Wade Survey, 14 miles northwest of Grapeland, Houston County, Texas. The start marks the end of a 3-month lull in operations in the 6,000-ft. Woodbine area of the Navarro Crossing field.

LANG & LEWIS, Allegan, Mich., have the contract for Earl G. Hartman 1 Truax, SW NW NE 11-1s-14w, Van Buren County, Michigan. Lang & Lewis also will deepen Lillie & Johnson 1 Beltman, SE SE SW 27-4n-14w.

MANNING & MARTIN, Inc., Denver, Colo., have a contract to drill to 5,600 ft. or 50 ft. into the Joss sand at Cow Gulch Oil Co. 1 Nelson on the Southwest Lance Creek structure in Niobrara County, Wyoming. It is 3½ miles south of the Lance Creek field.

CHARLES STOSKOPF has contract to drill Dudley Cecil Hay 1 Pineau, NW NE SE 11-1s-16w, Van Buren County, Michigan.

IVY Drilling Co. of Bakersfield, Calif., has commenced drilling on a 1,200-ft. wildcat test for E. A. Parkford of Beverly Hills. The location is in 12-29-21, ½ mile south of the producing limits of the South Belridge field.

HOLLANDSWORTH Drilling Co., Longview, Tex., has the contract to drill a 5,000-ft. test at Dean Brothers 1 fee, in the Weatherford Survey, 11 miles west of the town of Jefferson in Marion County, Texas. It is the first wildcat to be started in the county for some time.

S. J. BROWN, Falls City, Neb., has the contract to drill a wildcat northwest of the town of Hiawatha, Kans. Citizens of Hiawatha have subscribed the money for the test.

BREWSTER-BARTLE Drilling Co., Houston, Tex., has reached a depth of 9,964 ft. in Skelly 1 Vieman, a wildcat located in the J. White Survey, Brazoria County, Texas. In the Louisiana Gulf Coast district, one rotary is running in the Hackberry field, Cameron Parish, for the Navarro Oil Co., while in the Hawkins field another operation is reported for the same company.

BROWN Drilling Co. of Bakersfield, Calif., has contracted to drill two tests for Standard Oil Co. of California at Elk Hills. The tests will be known as Tupman 2-30 and Tupman 2-37.

ALLEN & MORRIS, San Antonio, Tex., is preparing to test Texon Royalty Co. 4 Horner in Nueces County, Texas, and is nearing the pay in the same field on Mid-Continent Petroleum Co. 1 Grove. In the East Premont area, Transwestern Oil Co. 6 Dunlap is being completed for a producer, while in the Alta Mesa field, Brooks County, Texas, one rotary is running for the Standard Oil Co. of Texas.

GEORGE ECHOLS, Houston, Tex., abandoned his 1 Armelise Planting Co., an interesting wildcat located on the east flank of the Napoleonville dome, Assumption Parish, Louisiana.

Contractors

The well was drilled to a depth below 8,900 ft., and several interesting showings were logged. In the St. Gabriel field, Iberville Parish, Louisiana, the contractor's 1-B Natalbany Lumber Co. was completed as a producer, and the rig is being moved to another location.

CRON & GRACEY, Houston, Tex.; has cemented casing on Moore & Ahern 1 Oslocsky, a north offset to the discovery well of the new North La Ward field in Jackson County, Texas.

OIL WELL Drilling Co. of Los Angeles, Calif., has contracted to drill a well for Richfield Oil Corp. in the Coles Levee field of the San Joaquin Valley to be known as KCL 1-G-29. Most of the drilling at Coles Levee in the past has been carried on by Richfield's company-owned tools.

MORRIS-HAMILTON Drilling Co., Houston, Tex., is drilling in shale below 3,916 ft. in H. E. Hamilton et al 1 J. M. Smith, a semiwildcat located on the Lockridge area, Brazoria County, Texas.

CABLE TOOL Drilling Co. is drilling below 1,750 ft. in the Taylor formation at 1 Williams, in the Elam Survey, 7 miles east of Greenville in Hunt County, Texas. The wildcat is scheduled to test the Woodbine sand. Elevation is 513 ft.

DELTA Drilling Co., Tyler, Tex., owner of a Paluxy wet-gas well in the northern end of the Chapel Hill field in Smith County, Texas, is constructing a 12-in. pipe line to provide an outlet for gas from the well. The line will extend 6 miles to the east to the East Texas field, where the distillate will be recovered. It will be terminated in Gregg County and will furnish lifting gas for Delta and other nearby producers.

PARKER Drilling Co., Houston, Tex., is testing an outpost well in the Port Allen field, West Baton Rouge Parish, Louisiana, for Amerada Petroleum Corp. Another operation is located offshort from Jefferson County, Texas, in the Gulf of Mexico for the British American Producing Co.

FARRELL Drilling Co. has issued plugging orders for 1 Gilliam, closely watched wildcat in the Spence Survey in Limestone County, Texas. The 1 Gilliam tested only fresh water in the Pettit and Travis Peak formations, logged at 3,640-3,715 ft. and 4,145-4,248 ft., respectively. The Smackover lime was missed entirely in drilling to 4,862 ft. in schist.

TWIN Drilling Co., Tulsa, which is drilling Pure Oil Co. 1 Reber, S½ NE NW 32-18n-10w, Reed City, Mich., is using a new casing program which may result in increased rotary drilling. The well was started with a 10-in. surface string set at 709 ft. and no other string is to be run until the top of the objective horizon has been reached—usually about 3,550 ft.

JACK FRAZIER, Houston, Tex., has reached a depth of 6,950 ft. in his 1 Mason & Briscoe, a wildcat located in the J. Foster Survey, Fort Bend County, Texas. Other activity is reported in the Dyersdale field, Harris County, Texas.

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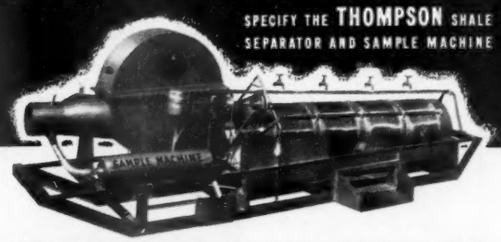

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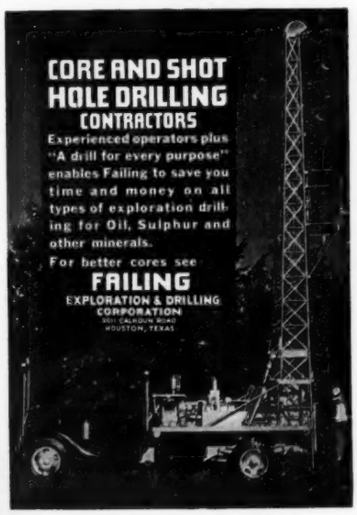
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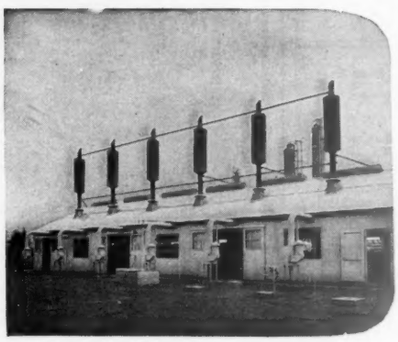
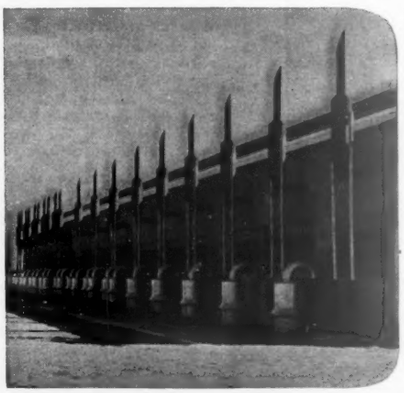


Maxims on an Illinois natural gasoline plant.



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Address .....
City ..... State .....

North Louisiana—Arkansas

(Continued from Page 70)

Nacatoch 662 ft., Smackover lime 1,394 ft., dry at 1,425 ft.

Lee County: Stanley A. Thompson 1 Comer, SW NE 17-3n-2e, dry at 3,807 ft. (no tops available).

Nevada County: Coker Oil 1 Dewoody, NE SW 23-11s-20w, dry at 1,900 ft.

Fields

Buckner, Lafayette County: Scott Hammond 1 McKean, SW NE 7-16s-22w, 250 bbl. oil and 14 bbl. water, 7,239-57 ft.

Dorcheat, Columbia County: Arkansas Fuel Oil 1 Barton, NW SE 14-18s-22w, 185 bbl. oil, 8,900-10 ft.

Fouke, Miller County: K. E. Jennings 1 Sturgis, SW SW NE 12-17s-27w, dry at 3,817 ft.

Macedonia, Columbia County: McAlester Fuel Oil 1 Nippen, S½ SW 16-18s-21w, 4,140,000 cu. ft. gas, 8,935-54 ft., and 269 bbl. distillate daily, T.D. 8,965 ft.

Smackover, Ouachita County: Bob Milam 1 Fincher, SW NE 32-15s-16w, 58 bbl. oil and 2 bbl. water, 2,515-24 ft.

J. D. Reynolds 3 Fincher, NW SE 29-15s-16w, dry at 2,622 ft.

Stephens, Columbia County: Crow Drilling 1 E. C. Smart, NE SW 12-15s-20w, 200 bbl. oil, pumping, 3,398 ft., total depth.

Fitzwater & Carpenter 1 Smart, SE NW NE 14-15s-20w, dry at 3,485 ft.

G. H. Vaughn 1 Smart, SE NW 13-15s-20w, 125 bbl. oil and 54 bbl. water, pumping, 3,411-25 ft., T.D. 3,503 ft.

Urbana, Union County: Marine Oil 1 Cordell, SE NW 5-18s-13w, dry at 3,561 ft.

New Wildcat Locations

Ouachita County: E. L. Foster 1 Miller, SE SE NW 4-15s-18w, location.

AVERAGE DAILY PRODUCTION

NORTH LOUISIANA

	Oct. 18	Oct. 11
Caddo light	6,360	6,350
Caddo heavy	2,210	2,225
Cotton Valley	16,185	16,270
Cross Lake	2,710	2,685
De Soto and Red River	995	980
Haynesville	2,640	2,600
Homer	2,950	2,965
Lisbon	2,750	2,830
Little Creek	2,310	2,225
Nebo	3,805	3,820
Olla	13,630	13,550
Rodessa	13,710	13,695
Sligo	2,510	2,525
Sugar Creek	1,550	1,540
Urania	2,295	2,325
Zwolle	985	1,025
Total North Louisiana	80,155	80,085

SOUTH ARKANSAS

Atlanta	2,865	2,830
Buckner	2,335	2,235
Champagnolle	975	850
Dorcheat	1,775	1,675
El Dorado	1,465	1,410
Magnolia	18,930	18,950
Nick Springs	735	750
McKamie	2,200	2,200
Rodessa	1,210	1,165
Schuler	16,650	16,700
Smackover light	1,850	1,875
Smackover heavy	12,760	12,810
Troy	805	1,030
Urbana	1,105	2,675
Village	945	880
Total South Arkansas	71,845	71,230

MISSISSIPPI

Tinsley	63,680	61 775
Pickens	450	360
Total Mississippi	64,130	62,135

Wildcat Staked in Marion County, Texas Border

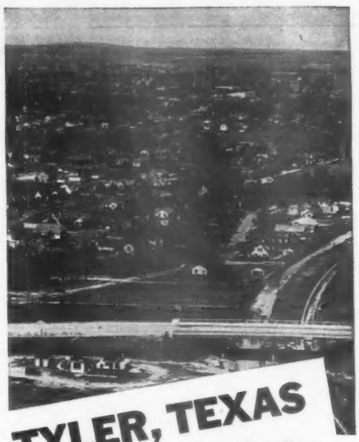
A new wildcat test for Marion County and the first for some time was scheduled to get under way within a few days. It will be Dean Brothers 1 fee, in the Weatherford Survey, 11 miles west of the town of Jefferson. It is located on a large 8,000-acre block acquired by Dean Brothers about 2 years ago and upon which a test has been planned ever since the acquisition. This location is the first of a now planned series of two exploratory holes for the block. Contract depth has been set at 5,000 ft. and Hollandsworth Drilling Co. of Longview has the contract.

In Shelby County, where production of distillate at the 6,514-28-ft. zone was indicated, the Grady Vaughn 1 Frost, Buckley Survey, 9 miles southwest of Center, is being deepened to a contract depth of 8,500 ft. In search of further pay zones. It was last reported at 6,909 ft. and conditioning hole.

EAST TEXAS BORDER COMPLETIONS

Fields

Pine Island field, Marion County: H. H. Groneman 1 M. D. Hart, M. G. Nail Survey, dry and abandoned at 2,140 ft.



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Layne-Western Co.	Kansas City, Mo.
Layne-Western Co. of Minnesota	Minneapolis, Minn.
Layne-Bowler New England Corp.	Boston, Mass.
International Water Supply	London, Ontario, Can.

Reed City Continues Expansion As Allowable Is Reduced

By OTTO C. PRESSPRICH

SAGINAW, Mich., Oct. 20.—In the face of state-ordered curtailment of per-well production from the Reed City oil field, development of the extending Osceola County hot-spot of Michigan oil activity continued without abatement last week. The completions reported listed six more wells there and one dry hole. In addition a half dozen others were at the testing stage.

By a staggered system of reducing per-well allowable from the Reed City field, output is scheduled to be cut from the present 480 bbl. to a maximum of 200 bbl. per well by December 1. The order, effective as of October 15 with a 130-bbl. cut, was issued by P. J. Hoffmaster, supervisor of wells, on recommendation of the Oil Advisory Board. It is designed to prevent market waste as new wells are completed. After December 1 the rate of production will depend upon field and market conditions.

On the basis of present market and facilities for transportation, Mr. Hoffmaster pointed out, not more than 25,000 bbl. a day can be moved from the field.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Bay County	3	680	8,743
Osceola County	6	15,070	21,640
Gas wells: Isabella County	1	*1.57	1,346
Dry holes: Livingston County	1	.....	1,211
Monroe County	2	.....	4,406
Oceana County	1	.....	2,021
Osceola County	1	.....	3,595
Tuscola County	1	.....	3,468
Total	16	.....	46,430

*Million cu. ft.

Some operators dispute his contention, however, and, partly as a result, Mr. Hoffmaster has called for a state-wide proration meeting to be held at Lansing October 27 to review conditions in other fields as well.

Large Producer Extends Reed City Field Northward

Noteworthy among the new wells in the Reed City field is Gulf Refining Co. 1 Truax, in Section 19, producing initially and naturally at 100 bbl. an hour and which extends the field another mile northward.

Also getting close watching was Ohio Oil Co. 1 Peiser in Section 6, Pinora Township, more than 7 miles northwest of the developed field. The hole was down in Dundee oil and water. However, officials doubted it would be a commercial well, basing their interest on the possibility it forecasts a new pool.

Aside from the Reed City development, three completions were reported in Bay County, all being commercial producers. In Monitor Township, Gulf continues to test its Bateson deep test. Distillate is being produced at a rate of 50 to 150 bbl. a day from the well with the gas flow at a rate of 3 to 6 million cubic feet daily.

A check of completions for September indicated that month may be the peak for the year in Michigan. Completions totaled 111, including 56 oil wells with potential of near 100,000 bbl. a day, 8 gas wells, and 47 dry holes. The rate was 70 per cent above that for August.

Issuance of drilling permits continued at a high rate during the week, 26 being issued by the state Conservation Department, including 10 to Osceola County. The 10 raised the number of tests authorized in that area, most of them around Reed City, to 112. Other permits were issued as follows: Four for Van Buren County tests; three each to Roscommon and Isabella; two each to Clare and Allegan; one to Ottawa, and one to Kent.

MICHIGAN COMPLETIONS

Bay County

Kawkawlin Township: Chapman Oil Co. 1 Wendt, SE SW SE 34-15n-4e, 217 bbl. first 13 hr., after acid, T.D. 2,942 ft.

Gulf Refining Co. 1 Friebe, NW SE NE Sec. 34, 123 bbl. first 12 hr. after acid, T.D. 2,905 ft.

Monitor Township: Basin Oil Co. 1 Francis-Swantek Comm., E½ NE NE 2-14n-4e, 40 bbl., acid, T.D. 2,896 ft.

Isabella County

Broomfield Township: L. & S. Drilling Co. 1 Brown Comm., SE NE NE 24-14n-6w, 1,570,000 cu. ft. gas, T.D. 1,346 ft.

Livingston County

Genoa Township: Fisher-McCall Oil & Gas Co., Inc., 1 Weimeister, C S½ S½ S½ 10-2n-5e, wildcat, dry, T.D. 1,211 ft.

Monroe County

Summerfield Township: Fred M. Douglass 2 Duval, SE NW NW 31-6s-6e, dry, after show of oil, T.D. 2,174 ft.

Fred M. Douglas 3 Duval, NE NW NW Sec. 31, dry, T.D. 2,232 ft.

Oceana County

Crystal Township: C. W. Teater 1-B Teater-Skidmore, SE NW SE 11-16n-16w, wildcat, dry, T.D. 2,021 ft.

Osceola County

Lincoln Township: C. W. Teater 1 Baderschneider, C S½ SW NW 30-18n-10w, pumping 70 bbl., after acid, T.D. 3,611 ft.

Pure Oil Co. 1 Gingrich, C S½ SW SW Sec. 30, 4,800 bbl., natural, T.D. 3,650 ft.

Ohio Oil Co. 2 State, C N½ NW NW Sec. 28, dry, T.D. 3,595 ft.

Ohio Oil Co. 2 Stedman, C N½ NW NW Sec. 29 1,800 bbl., T.D. 3,609 ft.

Gordon Oil Co.-Bolger Oil Co. 1 Media, C S½ SE SE Sec. 20, 3,600 bbl., T.D. 3,545 ft.

(Continued on Page 99)

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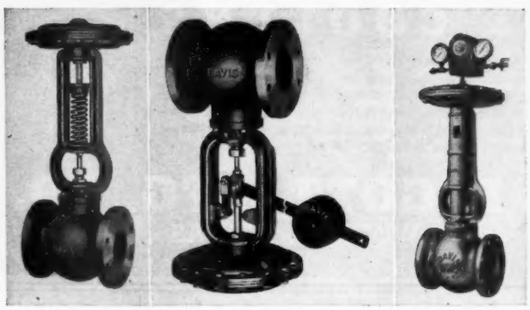

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Two New Gas-Distillate Sands Found on Bastian Bay Prospect

By F. L. SINGLETON

NEW ORLEANS, La., Oct. 20.—Additional sands carrying gas and distillate have been found to overlie the Bastian Bay structure in Plaquemines Parish, as Phillips Petroleum Co. continues to test 1 Louisiana Land & Exploration Co. This well was originally drilled to a total depth of 10,710 ft., and was completed in August at 9,350-53 ft. for an initial production of 324 bbl. daily through a 10/64-in. choke. However, production soon declined due to salt-water intrusion and the company has been testing other sands up the hole which showed favorable indications on an electric log. After testing gas-distillate the previous week at 6,566-70 ft., the well was plugged back and tested through perforated casing at 6,212-15 ft., where it flowed 1 bbl. of distillate and 1,000,000 cu. ft. of gas daily through ⅛-in. choke. These perforations were squeezed off, and the well is waiting on orders after another test at 3,996-99 ft. tested 2,880,000 cu. ft. of gas daily through ⅛-in. choke. Location for another well was made by the company, and it is assumed that gas from the discovery well will be used as fuel for the company's second operations.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	11	2,801	88,135
Dry holes: Fields	2	.....	6,676
Wildcats	2	.....	23,285
Total	15	.....	118,096

Westwego Extended

The Westwego field, Jefferson Parish, was extended several hundred feet as Stanolind 1 Wiegand was flowing 80 per cent oil while testing through perforated casing at 8,984-88 ft. This is the third producer for the field, which is located west of the New Orleans city limits.

Lapeyrouse Discovery Recompleted As Gas-Distillate Well

Gulf 1 Picou, the discovery well of the Lapeyrouse field, Terrebone Parish, has been recompleted for a gas-distillate producer and gas from the well will be used as fuel for drilling the company's 1 Eschette, an outpost test in 67-20s-18e. This well was originally completed for an oil well at 10,930 ft., but was killed and recompleted due to salt-water intrusion. On a 11-hour test through perforated casing at 10,887-94 ft., the well flowed 10 bbl. of distillate and an unestimated amount of gas.

Point Au Fer Discovery Yields Distillate

Barnsdall 3 Nelson, the discovery well of the Point Au Fer field, Terrebonne Parish, has been officially gaged at 30 bbl. of water-white distillate daily through a ¼-in. choke. Tubing pressure was 2,460 lb., and casing pressure 2,500 lb. Gravity of the oil tested 57.9°. Total depth of the well is 10,205 ft., and production is from perforated casing at 6,750-55 ft. Additional development is expected to be announced by the company in the near future.

Napoleonville Test Abandoned

George Echols 1 Armelise Planting Co., which showed promise of opening the first production for the Napoleonville dome, Assumption Parish, has been abandoned at 8,900 ft. following a series of tests at intervals from 8,300-8,800 ft. The well is located in 14-13e-12s on a farmout lease from Shell Oil Co., Inc., and additional development is expected to be announced for the area in view of the showings that were logged.

Second Tests in Three Fields

Texas 2 State, the second well to be drilled in the Delacrois Island field, Plaquemines Parish, has reached the testing stage. An electric log showed broken sand showing oil from 9,880-10,140 ft. At the end of the week the company was preparing to retest in the same sand section after salt water was recovered on a production test through perforated casing at 9,880-9,900 ft.

Union Sulphur Co. is moving in material for its second well on the southwest flank of the Vinton field, Calcasieu Parish. The well is 2 Gray in 4-11s-12w, about 430 ft. northeast of 1 Gray, recently abandoned at 5,057 ft. The company paid $50,000 for this 500-acre lease and agreed to drill two wells in the area.

Location for a second well was announced for the new Lake Chicot field, St. Martin Parish by Amerada Petroleum Corp. The well is located in 31-11s-10e, about 1 mile northeast of the discovery well. In the meantime the company was drilling below 2,800 ft. in 1 St. Martin Land Co., a wildcat located in 19-9s-8e, about midway between the Bayou Bouillon and the Section 28 fields.

New Sand at Welsh

On the south flank of the Welsh dome, Jefferson Parish, Union Sulphur Co. 1 Arceneaux, was reported to be showing for a producer while testing through perforated casing at 7,330-40 ft. The completion of this well as a commercial producer would open production from a new sand, about 1,000 ft. below established production. The sand section is believed to correlate with that of the Iowa field while produces from the basal Frio.

Cities Service Oil Co. staked location for 1 Lacasine, a projected 10,000-ft. wildcat located on the Thronwell

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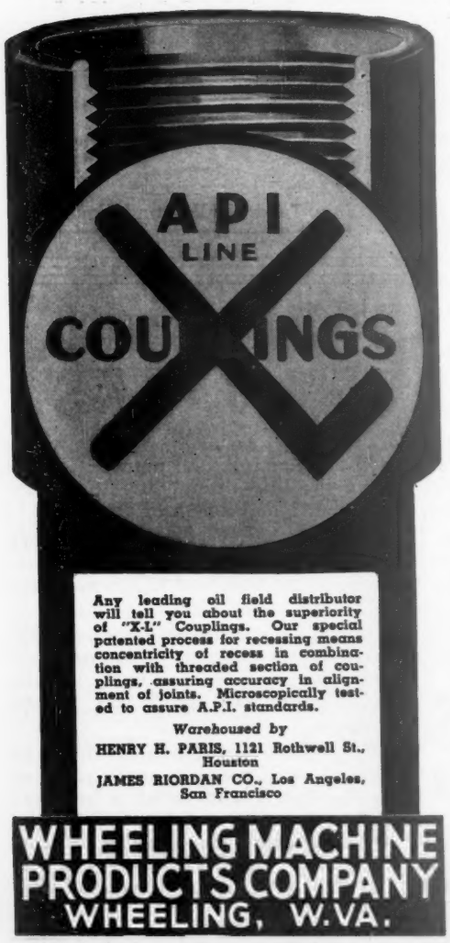

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prospect, south of the Welsh field in Jefferson Davis Parish. The location is in 36-11s-5w, on a block of about 5,000 acres which was leased on the strength of extensive geophysical work.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

Iberville Parish: Humble 1-B Schwing Lumber & Shingle Co., dry, T.D. 10,380 ft.

La Fourche Parish: Gulf 7 State, dry, T.D. 12,905 ft.

Fields

Anse La Butte, St. Martin Parish: Stanolind 1 Bergeron, 105 bbl., 9/64-in. choke, perf. casing 4,670-4,700 ft., T.D. 4,960 ft.

Bayou Blue, Iberville Parish: Superior 16 Schwing Lumber & Shingle Co., 124 bbl., 8/64-in. choke, perf. casing 3,796-3,800 ft., T.D. 6,006 ft.

Bayou Sale, St. Mary Parish: Humble 1 McAnelly, 844 bbl., ¼-in. choke, perf. casing 10,147-57 ft., T.D. 10,207 ft.

Edgerly, Calcasieu Parish: Star Fuel Oil Co. 1 Morrone, dry, T.D. 3,401 ft.

Erath, Vermilion Parish: Texas 1 Bellaire, 100 bbl., 1/64-in. choke, perf. casing 11,620-23 ft., T.D. 11,626 ft.

Jennings, Acadia Parish: Port City Oil Co. 30 Jennings Heywood, 25 bbl. oil and 10 bbl. salt water, pumping, perf. casing 1,538-78 ft., T.D. 3,000 ft.

La Fitte, Jefferson Parish: Texas 10-A Madison, 270 bbl., 5/32-in. choke, sand 8,016-90 ft., T.D. 8,210 ft.

Lake Long, La Fourche Parish: Fohs 15 State, 715 bbl., 16/64-in. choke, perf. casing 9,376-86 ft., T.D. 10,180 ft.

Pecan Lake, Cameron Parish: Superior 2-B Miami Corp., 16 bbl., 15/64-in. choke, perf. casing 10,154-64 ft., T.D. 11,426 ft.

Port Barre, St. Landry Parish: Pan American 11 Garland, 160 bbl., 9/64-in. choke, perf. casing 5,942-57 ft., T.D. 6,054 ft.

Section 28, St. Martin Parish: S. Rhodes 1 St. Martin Land Co., dry, T.D. 3,275 ft.

St. Gabriel, Iberville Parish: George Echols 1-B Natalbany Lumber Co., 194 bbl., ⅛-in. choke, perf. casing 7,776-84 ft., T.D. 7,839 ft.

Shell 6 Gueymard, 248 bbl., 9/64-in. choke, sand 8,592-8,627 ft.,

LOUISIANA GULF COAST DRILLING REPORT

Calcasieu Parish: Union Oil Co. of Calif. 1 Gray, 4-11s-92, moving in rig.

Iberia Parish: Gulf 2 Petit Anse Co., 25-13s-5e, drilling shale 8,515 ft.

Nebraska-Missouri

(Continued from Page 87)

abandoned when tools were lost in the hole. Uhrj Oil Co. 1 Ogle was the pool opener.

For Missouri, the most important activity in the northwest sector is the Ohio Oil Co. new wildcat about to start 11 miles south of St. Joseph, at Wallace, in Buchanan County. General Geophysical Co. has set up its rotary rig and will begin drilling at once. For some reason, company geologists and members of the Missouri State Geological Survey are talking more about gas than oil in connection with this wildcat.

IOWA COMPLETIONS

Wildcats

Montgomery County: Ohio 1 Peterson, SE SE 5-72n-38w, dry, T.D. 2,758 ft., Lansing 70 ft., base Kansas City 305 ft., Mississippian 1,153 ft., St. Peter 2,655 ft., Arbuckle 2,676 ft.

MISSOURI COMPLETIONS

Wildcats

Shelby County: McAlpine et al 1 McKillip, SE SE SE 35-59n-11w, dry, T.D. 800 ft., base Mississippian 300 ft., Kinderhook 300 ft., Hunton 433 ft., Viola 598 ft., Decorah 650 ft., St. Peter 700 ft., Arbuckle 793 ft.

Michigan Fields

(Continued from Page 97)

Gulf Refining Co. 1 Truax, C S½ NE NE Sec. 19, 2,400 bbl., T.D. 3,605 ft.

Gulf Oil Co. 2 Lindner, C N½ SE SE Sec. 19, 2,400 bbl., T.D. 3,620 ft.

Tuscola County

Wisner Township: Brehm Oil Co. 1 Polmanteer, NE SE SW 24-14n-7e, dry, T.D. 3,468 ft.

Desulfurization Plant to Be Built at McKamie Field

SHREVEPORT, La., Oct. 20.—Based on results of a pilot plant for desulfurizing the extremely sour gas in the McKamie field of South Arkansas, Carter Oil Co. is going ahead with plans to construct a large-scale desulfurization plant in the field. The actual site of the plant has not been determined as yet.

The McKamie field yields next to the sourest gas in the district with some 4,250 grains of hydrogen sulfide per 100 cu. ft. of gas. The recently discovered Patton field to the west and in Lafayette County, yields more than 9,000 grains per 100 cu. ft. of gas. Market for the desulfurized gas is to be furnished by the proposed construction of a large aluminum plant just northeast of El Dorado and also a large anhydrous ammonia and ammonium nitrate plant near Calion just east of El Dorado. Neither of these plants is definitely decided upon as yet but indications point to their location in this area. The size and total output of the new desulfurization plant planned by Carter Oil has not been released.

New Field Opened in Upper Texas Gulf Coast

HOUSTON, Tex., Oct. 21.—Stanolind 1 Parker, a wildcat located in the Fred area, southeastern Tyler County, showed promise of opening a new Wilcox sand field for the upper Texas Gulf Coast district as a 32 drill-stem test at 8,184-8,201 ft. recovered 10 stands of oil and tested 84 lb. working pressure. The well is located in the G. T. W. Collins Survey, several miles south of the Joe's Lake field.

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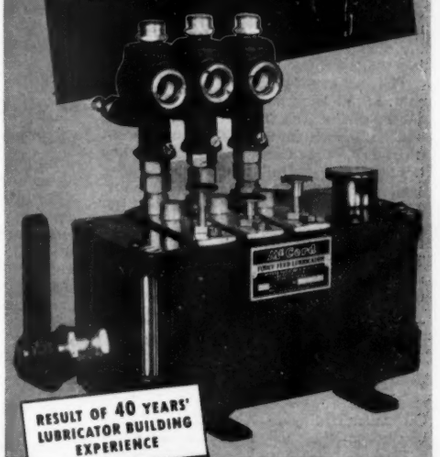

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MISSISSIPPI AND SOUTHEAST

Warren County Wildcat Shows Oil on Early Tests

By R. MARNE SANFORD

JACKSON, Miss., Oct. 20.—Offering production possibilities from the Wilcox section in Warren County, Magnolia 1 J. H. Hall, located 467 ft. from the south line and 1,360 ft. from the west line of the NE cor. 39-17n-4e, was coring ahead in saturated sand and preparing to test this week.

The wildcat is about 5 miles northeast of Vicksburg and some 28 miles southwest of the Tinsley field and an equal distance south of the most recent discovery, the Cary field of Sharkey County. The 1 Hall topped the Wilcox section at 2,195 ft. and cored from 2,192-2,202 ft. recovering 5 ft. of which the upper 3 ft. was shale and the lower 2 ft. was soft, unsaturated, porous sand. The oil was thick, heavy and black in nature of a very low gravity. Another core from 2,202 to 2,212 ft. showed no recovery. The section was drill-stem tested with packer set at 2,187 ft. and after having the tool open for 2½ minutes, the well blew some mud and oil. The test ultimately showed 320 ft. of mud and some black heavy oil.

The wildcat is correlated some 600 ft. higher than surrounding area and is located on a salt-dome structure. At last report the well was coring ahead below 2,212 ft. and another test is likely to be made at 2,222 ft. The company observers expressed belief that some sort of a commercial well was possible.

SUMMARY OF COMPLETIONS

Mississippi

	No.	Bbl.	Footage
Oil wells: Tinsley ...	7	2,285	34,560
Dry holes: Wildcats	1	.....	4,026
Tinsley	1	.....	4,875
Total	9	.....	43,461

Alabama

	No.	Bbl.	Footage
Dry holes: Wildcats	1	.....	1,172

Wilkinson County Is Active In Wilcox Area

With one wildcat already spudded and drilling below 2,000 ft. toward the deep Wilcox sands, another is in the making for the immediate future. Spreads are reportedly being purchased in a large block held by T. B. Burris, preparatory to starting a deep Wilcox test within 60 days. The location on the block is in SW SW 10-3n-1e, Wilkinson County.

Just this past week 10¾-in. casing was set at 1,117 ft. in the Bering Oil 1 Crosby Lumber Co., located in SW SW SW 15-4n-22, on a geophysical prospect in Wilkinson County. It was last reported below 2,610 ft.

Second Well for Unnamed Sand Completed at Tinsley

The Tinsley field is producing from six distinct pay levels. In order of occurrence from top to bottom they are the Woodruff zone, Perry sand, Stevens sand, Tammons level, an unnamed sand opened in the north end of the field, and lastly the Powell sand. The past week a second well was completed from this unnamed sand in the north of the field. The pay level was discovered several months ago by Union Producing Co. 2 Powell, on the extreme north edge of the field.

The new well is Sinclair-Wyoming Oil 1 McGraw, S½ SW NW 36-11n-3w. It had basal Eutaw at 5,820-39 ft., set 7-in. at 5,851 ft., drilled to 5,868 ft. and perforated casing from 5,820-30 ft. With 2½-in. tubing set at 5,832 ft. the hole was swabbed for 2½ hours when it kicked off to flow 380 bbl. of oil in the following 7½ hours. The oil was 47.8 gravity at about 84° temperature. Probably additional development will now be projected to this pay level.

Tinsley Test Seeks Deep Pay Levels

With the deepest pay level at Tinsley being the Powell sand, a test in NW NW 10-11n-2w, is being projected to possibly this level in search of the deep pays. It was formerly Texas Pacific 1 J. S. Allgood but has been taken over by Hassie Hunt at a total depth of 6,147 ft. Plans are to deepen an additional 200 ft. The Wilcox was topped at 2,040 ft., Midway 4,235 ft., Selma 5,114 ft., Woodruff 5,414-40 ft., Eutaw 5,673 ft., Perry sand 6,027-44 ft., Stevens sand 6,127-33 ft.

MISSISSIPPI COMPLETIONS

Wildcat, Lauderdale County: Pierce Watters 1 A. L. Meeds, C W½ SW 26-5n-15e, top Midway 1,500 ft., Selma 1,968 ft., Eutaw 2,905 ft., Tuscaloosa 3,381 ft., Paluxy 4,520 ft., dry at 4,026 ft.

Tinsley, Yazoo County: Hassie Hunt 2 J. O. Martin, NW S¼ NE SW 35-10n-3w, T.D. 4,843 ft., Woodruff 4,835-43 ft., pumped 32 bbl. per hr.

E. C. Johnson 3 Brumfield, SE NW S½ SE NW 36-10n-3w, top Tallahatta 1,675 ft., Wilcox 1,968 ft., Midway 4,003 ft., chalk 4,735 ft., Eutaw 4,771 ft., no Woodruff present, dry at 4,875 ft.

Kirby Pet. 6 G. W. Stutts, NE SE SE 30-10n-2w, T.D. 5,020 ft., Woodruff 4,968-5,032 ft., perf. casing 4,965-5,010 ft., pumped 259 bbl. in 13 hr.

Magnolia 9 Mitche Payne, NE SW SE SE 35-10n-3w, T.D. 4,906 ft., Woodruff 4,885-4,906 ft., pumped 500 bbl. daily.

Phillips 1 Lilmar, SE NW SE NW 6-9n-2w, T.D. 5,100 ft., Woodruff 5,002-28 ft., perf. casing 5,005-24 ft., pumped 126 bbl. oil and 86 bbl. water daily.

Phillips 2 Twinner, SE N¼ 6-9n-2w, T.D. 5,105 ft., Woodruff 5,017-98 ft., pumped 87 bbl. oil and 513 bbl. water daily.

Snowden & McSweeney 2 Ben Hanley, SE NW SE 35-10n-3w, T.D. 4,800 ft., Woodruff 4,761-85 ft., pumped 30 bbl. per hr.

Union Producing 2 J. R. Williams, SW NE 35-10n-3w, T.D. 4,786 ft., Woodruff 4,714-42 ft., pumped 64 bbl. in 4 hr.

MISSISSIPPI WILDCAT REPORT

Copiah County: Sun Oil 1 J. G. Ainsworth, N½ NW SE 17-9n-7e, 16-in. 90 ft., 10¾-in. 1,416 ft., top Vicksburg 1,220 ft., Moody 1,785 ft., Cockfield 1,815 ft., Cook Mountain 2,168 ft. Sparta 3,435 ft., Cane River 3,174 ft., Tallahatta 3,491 ft., Merichian sand 3,743 ft., Wilcox 3,790 ft., drilling 5,530 ft.

Grenada County: H. T. Salter 1 Carpenter, NE SE 6-21n-7e, rigging up rotary.

Issaquena County: John D. Gholson and Jess Bohan 1 Carrie M. Oden, NW NE 31-9n-6w, derrick.

Kemper County: Darrel C. Williams 1 McKelvain, SE NE 2-9n-17e, top Selma 724 ft., Eutaw 1,400 ft., Tuscaloosa 1,960 ft., show gas 2,175 ft., T.D. 3,172 ft., made electrical survey of hole and S.D.O.

Lawrence County: Tide Water 1 Denman Lbr. Co., N½ SW 5-5n-11e, drilling 9,303 ft.

Montgomery County: Henderson Oil 1 J. M. Dotson, SW SE SW 12-19n-6e, spudding.

Warren County: Magnolia 1 H. Hall, NE NW NE irregular 39-17n-4e, top Wilcox 2,195 ft., cored 2,192-2,202 ft., recovered 3 ft. oil sand, cored 2,202-12 ft., no recovery, D.S. test showed heavy black, low-gravity oil, will core deeper and test.

Wilkinson County: Bering Oil 1 Crosby Lumber Co., SW SW SW 15-4n-2w, 6,500-ft. test, 10¾-in. 1,117 ft., drilling 2,610 ft.

Alabama Wildcat Drilling Below 12,300 Ft.

Still holding attention and still drilling deeper is Union Producing Co.'s wildcat in Clarke County, Alabama. It is 1 M. M. Waite, C NW 27-8n-1w, and is now below 12,351 ft. Below 10,000 ft. two tentative tops have been called. The Pottsville was set at 11,700 ft. while the anhydrite was called at 11,800 ft.

A shallow wildcat test was abandoned in Madison County, Alabama, the past week. It was Mellen & Thompson 1 Alice Baldridge, NE NE NW 8-1s-1e. The hole was bottomed at 1,172 ft. and quit after salt water was found at 1,142 ft. The test found the top of the Silurian lime at 11 ft., topped the underlying Ordovician section at 90 ft., Stone River

(Continued on Page 106)

CANADIAN FIELDS

Increased Drilling Keeps Production at High Level

By VICTOR LAURISTON

CHATHAM, Ont., Oct. 20.—Crude production from all Alberta fields in August totaled 832,857 bbl., or 26,866 bbl. daily, an increase of 11 bbl. daily over July and 268 bbl. daily over August 1940. This was supplemented by 20,706 bbl. of natural gasoline from Turner Valley absorption plants, or 668 bbl. daily, a decrease of 22 bbl. daily from July but an increase of 22 bbl. daily over August 1940.

Turner Valley production in August included: shallow crude, 449 bbl.; limestone naphtha, 1,156 bbl.; limestone crude, 825,321 bbl.; natural gasoline, 20,706 bbl. From outside fields the crude production for August was Red Coulee, light crude, 917 bbl.; Wainwright, heavy crude, 753 bbl.; Del Bonita, light crude, 150 bbl.; Dona, heavy crude, 500 bbl.; Steveville-Princess, light crude, 1,403 bbl.; Vermilion, heavy crude, 2,208 bbl.

Natural-gas production from all Alberta fields totaled 4,441,868,000 cu. ft., or 143,285,000 cu. ft. daily, compared with 144,975,000 cu. ft. daily in July and 145,450,000 cu. ft. daily in August 1940. The daily averages included: Turner Valley, 128,936,000 cu. ft.; Viking-Kinsella field, 5,483,000 cu. ft.; Medicine Hat-Redcliff, 7,417,000 cu. ft.; other fields, 1,449,000 cu. ft. Wastage from Turner Valley totaled 2,905,591,000 cu. ft. for the month, but 2,554,772,000 cu. ft. of Turner Valley gas was processed in absorption plants.

Crude-petroleum stocks in Alberta, as of September 1, 1941, amounted to 941,072 bbl., a decrease of 262,704 bbl. from July 1 and 227,703 bbl. from August 1, 1940.

Among Turner Valley crude wells, the largest producer in August was Home Oil 7, with 27,018 bbl. for the month. Other large wells were: Home Oil 2, with 24,608 bbl.; Miracle Royalties 1, with 23,027 bbl.; Alberta Oil Incomes 2, with 20,459 bbl.; Home Oil 1, with 17,574 bbl.; Foothills Oil & Gas 5, with 16,483 bbl.; Home Oil 3, with 15,831 bbl., and Foothills 7 with 15,154 bbl. All these producers were in North Turner Valley.

Revenue from August sales totaled $1,301,225, or $41,975 daily.

Alberta crude and natural-gasoline production for the week ending October 6 averaged 27,925 bbl. daily from 189 wells, compared with 29,247 bbl. daily for the previous week, and 25,931 bbl. daily for the corresponding week of 1940. The daily average included 27,066 bbl. of crude and 668 bbl. of natural gasoline from Turner Valley, and 191 bbl. crude from outside fields. There were 189 producing wells with 26 drilling, 2 finished, 1 producer, 7 testing, 2 shut down, 1 resuming, 1 abandoned, 2 drilling licenses issued, and 2 new wells spudded.

TURNER VALLEY LIME TESTS

North Turner Valley: Major Oils 3, LSD 1, 8-21-3w5, below 7,925 ft., Madison at 7,655 ft., with 93 ft. of porosity in the upper zone.

Home Oil 9, LSD 9, 15-20-3w5, T.D. 8,478 ft., Madison at 7,974 ft., acidizing and testing.

West Central section: Okalta Oil 11, LSD 10, 24-19-3w5, finished at 8,220 ft., Madison at 7,752 ft., acidizing and testing.

Renown Royalties 1, LSD 8, 24-19-3w5, T.D. 7,969 ft., Madison at 7,496 ft., initial production 302 bbl. daily after acidizing, temporary allowable 121 bbl. daily.

Alberta Pacific Royalties 1, LSD 14, 6-19-2w5, below 8,150 ft., Madison at 7,872 ft.

Steveville Producer

In the Steveville field, eastern Alberta, Standard of British Columbia 2 Princess, LSD 3, 13-20-12w4, after tests extending over a month, is making 115 to 130 bbl. net crude daily, after allowing for water ranging from 15 to 18 per cent. Test, drilled originally into the Devonian limestone and plugged back to the Madison at 3,335 ft., was the crude discovery well of the field, making a flush of 521 bbl. daily of 26.3 crude, with 1,275,000 cu. ft. daily of gas. Later it went off production, and protracted efforts were required to

(Continued on Page 111)

LEGAL

Department of the Interior, United States Land Office, Cheyenne, Wyoming. Notice is hereby given that the oil and gas deposits in the W½ NE¼ and NE¼ NW¼ Sec. 14, T. 32 N., R. 82 W., 6th P.M., containing 120 acres, in the Iron Creek oil and gas field, Wyoming, are offered as one unit to the responsible qualified bidder of the highest bonus per acre for leasing, pursuant to the provisions of section 17 of the leasing act of February 25, 1920 (41 Stat. 437), as amended by the act of August 21, 1935 (49 Stat. 674), at the royalty rate scale in the lease form shown in circular 1386. The sale will be held in this office at 10:00 o'clock A.M., on October 28, 1941. The successful bidder must deposit on the date of sale with the Register, a certified check on a solvent bank, or cash, for one-fifth of the amount bid by him, and file a showing of qualifications to receive a lease, required by section 7 of circular 1386. The remaining four-fifths of the amount of the bid, together with the annual rental at the rate of $1 per acre, must be paid, and a $5,000 corporate surety bond furnished prior to the issuance of the lease. A stipulation for the protection of the Kendrick Reclamation Project, a copy of which may be obtained from this office, will be made a part of the lease. Bidders are warned against violations of the provisions of section 59 of the United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior. Register.

PRIORITIES

(Continued from Page 23)

without serious loss of efficiency by substitution of less scarce material or by simplification of design.

(g) Restrictions on deliveries, withdrawals and inventory.

1. Except as provided in paragraph (*g*)(5), no producer shall, during any calendar-quarterly period, accept deliveries (whether or not rated pursuant to this Order) of any items of material to be used as operating supplies or for maintenance or repair the aggregate dollar volume of which shall exceed 25 per cent of the aggregate dollar volume of the withdrawals of items of material of the same class as carried on the producer's books from stores or inventory during the calendar year 1940.

2. Except as provided in paragraph (*g*)(5), no producer shall, at any time, accept deliveries (whether or not rated pursuant to this Order) of any item of material to be used as operating supplies or for maintenance or repair until the producer's inventory and stores of items of material of the same class, as carried on the producer's books, have been reduced to a practical working minimum. Such practical minimum shall in no case exceed the aggregate dollar volume of items of material of the same class, as carried on the producer's books, in inventory and stores on December 31, 1940, or, at the producer's option, at the close of the producer's fiscal year ending during the calendar year 1940.

3. Except as provided in paragraph (*g*)(5), no producer shall, during any calendar-quarterly period, make withdrawals from stores or inventory of any items of material to be used as operating supplies or for maintenance or repair the aggregate dollar volume of which shall exceed the aggregate dollar volume of the withdrawals of such items of material of the same class, as carried on the producer's books, during the corresponding quarter of 1940, or, at the producer's option, 25 per cent of the aggregate dollar volume of the withdrawals of such items of material of the same class as carried on the producer's books during the calendar year 1940.

4. Notwithstanding the provisions contained in paragraph (*g*)(1), (2), and (3), a producer may, upon application to and with the approval of the Director of Priorities, in any calendar-quarter increase the aggregate dollar volume of deliveries accepted of material for use for maintenance and repair or as operating supplies, withdrawals of material for such use, or inventory of material for such use over the aggregate dollar volume of deliveries, withdrawals or inventory of material for such uses during the last preceding corresponding calendar-quarter proportionately to the increase of the volume of goods or services produced or rendered by him in such quarters.

5. Restrictions contained in paragraphs (*g*)(1), (2), and (3) shall not apply to any producer during any calendar-quarterly period in which the total volume of his purchases or withdrawals of material for maintenance, repairs, and operating supplies does not exceed $2,500.

(h) Audits and reports.

1. Each producer or supplier who applies the preference rating hereby assigned, and each person who accepts a purchase order or contract for material to which the preference rating is applied, shall submit from time to time to an audit and inspection by duly authorized representatives of the Office of Production Management.

2. Each such producer or supplier shall execute and file with the Office of Production Management such reports and questionnaires as said office shall from time to time request. No such reports shall be filed until such time as the proper forms are prescribed by the Office of Production Management.

(i) Utilities and mines excepted.

This Order is not applicable to any utility defined as a producer in Preference Rating Order No. P-46 (section 978.1), nor to any mine as defined in Preference Rating Order No. P-56 (section 982.1). The Director of Priorities may from time to time specifically except further classes of producers from this Order by specific direction.

(j) False statements and penalties.

Any person who applies the preference rating hereby assigned in wilful violation of the terms and provisions of this Order or wilfully falsifies any records which he is required to keep by this Order, or who obtains a delivery of material by means of a material and wilful misstatement will be forbidden to further apply said rating. Such person may also be prohibited from obtaining further deliveries of material under allocation and be deprived of any other priorities assistance. The Director of Priorities may also take any other action deemed appropriate, including the making of a recommendation for prosecution under section 35A of the Criminal Code (18 U. S. C. 80).

(k) Revocation or modification.

This Order may be revoked or amended by the Director of Priorities at any time as to any producer or supplier. In the event of revocation, or upon expiration of this Order, deliveries already rated pursuant to this Order shall be completed in accordance with said rating, but no applications of this rating to any other deliveries shall thereafter be made by the producer or supplier affected by said revocation or expiration.

(l) Effective date.

This Order shall take effect immediately, and unless sooner revoked shall expire on the first day of April 1942.

(P. D. Reg. 1, Aug. 27, 1941, 6 F. R. 4489; OPM Reg. 3 Amended, Sept. 2, 1941, 6 F. R. 4865; E. O. 8629, Jan. 7, 1941, 6 F. R. 191; E. O. 8875, Aug. 28, 1941, 6 F. R. 4483; sec. 2(*a*), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; sec. 9, Public No. 783, 76th Congress, Third Session.)

Issued October 16, 1941.

Signed: Donald M. Nelson, Director of Priorities.

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Compact Members Told New Records in Demand Assured

(Continued from Page 17)

the next session of the compact which probably will be held in December. The election of officers will take place at that time.

Record Demands Assured

A. G. White, chief of the division of petroleum economics of the Bureau of Mines, which compiles the monthly estimates of petroleum demand for the state allocation bodies, predicted further increases in petroleum requirements over the balance of this year and through 1942. He stressed the fact that owing to the substantial withdrawals from storage over the past year and with exports and imports practically in balance, new demands would have to be met through the expansion of domestic crude-oil production and refinery operations.

Mr. White's first prediction was that next November's demand for domestic crude oils would average 4,070,000 bbl. daily, the largest in the history of the industry, and 465,000 bbl. daily or 13 per cent greater than in November 1940. He said that owing to the increasing defense and lend-lease demands and the constantly expanding normal requirements no seasonal contraction in producing and refinery operations is in prospect at this time. He explained that the bureau's reports indicated that the demand for domestic crude oils averaged 4,040,000 bbl. daily for the third quarter of this year, with crude runs to stills of 3,980,000 bbl. daily. The outlook for the final quarter indicated that domestic producers would be called upon to supply 4,040,000 bbl. daily, with crude runs to stills of 4 million barrels daily.

Operating developments of the past year were discussed by Mr. White with the observation that so far a 13 per cent growth in domestic requirements has been provided for, with only a 4 per cent expansion in total output. A decrease in exports brought the gain in total demand down to 9 per cent, and the difference between 9 per cent and 4 per cent is accounted for through reductions in stocks totaling 31,000,000 bbl. up to August 31. He estimated that the reductions in inventories for the entire year would total 28,000,000 bbl., which largely offsets the 39,000,000-bbl. increase in 1940. The total demand for all oils this year was placed at 1,571,000,000 bbl., a gain of 120,000,000 bbl. for the year. The total motor-fuel demand for 1941 will be 683,000,000 bbl.

An increase of 6 to 7 per cent in 1942 over 1941 was given as an estimate by Mr. White, with the gains to be irregular divided throughout the year. The 1942 requirements include a large expansion in the Navy's consumption of fuel oil, which may total 30,000,000 bbl.

The East Coast situation is better than was expected, according to the head of the petroleum division. Stocks of all oils on September 30 were 77,000,000 bbl., a decrease of 5,000,000 bbl. compared to the same date in 1940. August deliveries were 4,000,000 bbl. greater than in August 1940. He pointed out that due to the heavy demand for fuel oils, the East Coast petroleum needs, starting in November and extending through February, will be greater than they have been in recent months.

Waste Refined

Physical waste reflected in oil-field gas burned in flares and underground waste defined as "failure to recover the greatest amount of oil through improper production practice, and improper reservoir management" were discussed by E. L. De Golyer, Dallas operator and engineer who is serving the Office of Petroleum Coordinator as director of conservation. In regard to gas, he recommended better control of gas-oil ratios and the return of gas to producing formations.

"How many of you regard a new pool as a trust to be carefully studied by your engineers and administered in the public interest in order to achieve optimum production rather than as something of a necessary nuisance to be crowded into your already-crowded schedules of apportionment of the state's market demand?" Mr. De Golyer asked in urging that every pool be considered a unit and the best engineering practices applied in its development.

In explaining that the objectives of conservation were to increase available reserves of oil and gas, Mr. De Golyer said: "We are somewhat too complacent at present with regard to our reserve position." He cited reports showing that reserves in this country reached a maximum figure of 21 billion barrels on January 1, 1939, and over the past 2¾ years production has exceeded new discoveries. Regarding this situation he said in part:

"Following the line of reasoning commonly followed by the industry, the American Petroleum Institute (Petroleum Facts and Figures, 7th ed.) notes that 7.2 billion barrels of oil were produced from 1935 to 1940, inclusive. Since their estimates of proved reserves increased from approximately 12.2 billion to 19 billion barrels during the same period, they conclude that the industry "discovered and developed" 14 billion barrels of reserves during the 6-year period, gaining some 6.8 billion

barrels on balance. Actually, the industry appears to have discovered some 9 billion barrels during the 1935-40 period and the increase in reserves appears to have been slightly less than 2 billion barrels, the remaining 4.8 billion barrels claimed being merely the result of upward revision of estimates for fields previously discovered."

More Materials

Robert E. Allen, director of production for the Office of Petroleum Coordinator, brought an encouraging message regarding the materials outlook for the petroleum industry. He explained there was a more general recognition in Washington of the essential part that petroleum will play in the defense program, including aid to the powers opposing the Axis, together with a realization that materials must be made available to assure adequate output. He added that OPC places at the top of the list those supplies required to find more oil, including those needed for all types of exploration and wildcat drilling.

Mr. Allen indicated that OPC also realized that to maintain a domestic production of 4 million barrels daily, which is the current rate of consumption, it will be necessary to drill 30,000 wells annually. In regard to demand, he explained that the first duty is to see that British and the Soviet Union are amply supplied and the defense requirements of this country provided for.

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Crude Raise Needed to Save Strippers

(Continued from Page 16)

Allen in response to questions on the general subject of priorities.

One of the most severe handicaps under which the OPC has labored in its attempts to obtain preference ratings on oil equipment is the public illusion that all the industry has to do to increase production by any given amount is to open a few valves. This misconception of the oil industry's position, Mr. Allen told his questioners, has been built up in the minds of the public, mostly by popular magazines and by Sunday supplement writers but partly by the industry itself in its zeal to forestall centralized control.

The chief reason for persistent support of all exploratory work in the petroleum industry given by the petroleum coordinator and his staff is the calculation that 700,000,000 bbl. of new reserves are required to support each increase of 100,000 bbl. in daily production, Mr. Allen declared. He added that applicants for equipment for use on an exploratory well might reasonably expect delivery on casing, under present conditions, within 90 days.

Importance of material supply was evidenced by the fact that two of the seven resolutions adopted by the resolutions committee dealt with priorities problems. One of the resolutions called on OPM to provide a preference rating which would enable the oil industry to obtain material and equipment to carry on the full effort of national defense. The other resolution affecting equipment called the attention of the petroleum administrator to the necessity of maintaining the proper balance between the price of secondhand and used equipment and that of new equipment. During the last war, the resolution pointed out, the bootlegging of equipment caused premature abandonment of stripper wells; some of the practices of 24 years ago are beginning to make an appearance and stripper-well owners fear an extension.

One of the other resolutions called on Congress to amend the Fair Labor Standards Act to permit proper exceptions from the law to be made to meet the peculiar situations of the stripper-well branch of the petroleum industry.

The Interstate Compact Commission was requested to take appropriate steps to secure from state regulatory bodies proper consideration of the problems of stripper-well owners.

Other resolutions included one which called on the members of the association to urge representatives in both branches of Congress to consider legislation which would forbid the importation of oil produced on properties confiscated by any foreign government without adequate compensation to the owners, and another which would rescind the reduction in excise taxes under trade agreements and which would also limit petroleum imports to 4.5 per cent of the domestic demand. The resolutions committee completed its report with the statement that "The industry is fortunate in having men of the type of Ralph K. Davies, Robert Allen, Wirt Franklin and others to present its case in Washington."

Reelect Officers

C. P. McGaha, Fain-McGaha Oil Corp., Wichita Falls, Tex., was reelected president by the stripper-well operators along with Executive Vice Pres. H. B. Fell, Simpson-Fell Oil Co., Ardmore, Okla., and Sec.-Treas. Howard J. Whitehill, Whitehill Oil Corp., Tulsa. Vice presidents include Guy T. Berry, Independence, Kans.; Richard Fenton, Los Angeles, Calif.; Wirt Franklin, Ardmore, Okla.; A. H. Ledbetter, Mount Pleasant, Mich.; Harry Leonard, Roswell, N. M.; Lee Mulvihill, Robinson, Ill.; W. H. Keffer, Ashland, Ky.; and Ralph T. Zook, Bradford, Pa. The executive committee is composed of two members from each of the member associations.

The luncheon session also included an address by Mr. McGaha on activities of the association and a paper titled "Our Rights and Duties Under Temporary Federal Control" by Burdette Blue, attorney, and addresses by Wirt Franklin, director of production for District 2 of OPC, and J. C. Watson, executive vice president, West Central Texas Oil and Gas Association. W. A. Goforth, president of the Oklahoma Stripper Well Association, made the address of welcome and introduced Mr. McGaha.

Three associations, the Bradford District Pennsylvania Oil Producers Association, the California Stripper Well Association, the West Central Texas Oil and Gas Association, have joined the National Stripper Well Association, Mr. McGaha reported in outlining the growth of the organization. He also pointed out the progress made by the group in assisting the Interstate Compact Commission and cooperating with the Office of Petroleum Coordinator. The association submitted a report to OPC, he said, containing factual data and charts on stripper-well operation, the production problems and the importance of preserving the reserves underlying such wells. The report also pointed out that an adequate price for oil was necessary to maintain this production.

After outlining the history and background of attempts to establish federal control by the present administration. Mr. Blue said in his paper: "So much emphasis has been placed on the industry's fundamental objections to permanent federal control that there should also be stressed the advisability, not only of accepting the fact accomplished, but further of demonstrating to Coordinator Ickes, and to all members of his staff, that it is the purpose of the industry to make this temporary expedient a joint adventure—one which will reflect credit upon him, his entire staff, the various state regulatory bodies, the Interstate Oil Compact Commission, and upon the industry as well."

Mr. Blue then outlined what may be expected in case a shortage of crude production develops with some companies being affected at first and all companies eventually. He called on the industry to continue to improve its practices, secure additional needed state legislation, support the interstate compact, seek stricter observance and enforcement of all conservation laws, oppose selective buying, insist upon nondiscriminatory and ratable taking and cooperation with the petroleum administrator and his staff.

J. C. Watson pointed out in his talk "The Primary Problem of Stripper Well Producers," that the oil producers should be alert, active and articulate in this present day of rapid developments and that they should meet the problems of broad economic and political change with the same courage and determination presented in the concrete operation of their businesses.

A short extemporaneous speech by Congressman Wesley E. Disney was a directed plea to the oil men to express themselves to their congressmen and to encourage their representatives to fight against the progress of bureaucracy. Complacency is dangerous, he said, if we are to avoid too much government.

A plea to set aside fear and make the oil industry one solid phalanx for the preservation of liberty was made by Mr. Franklin. He reported that in District 2 a study was in progress to determine how much sustained efficient production could be maintained with some degree of certainty. The policy of the petroleum coordinator is to encourage exploration but when a new field is discovered the location spacing should be as wide as possible, he said. The first wells should be on 40 or 80-acre spacing pending study of the most efficient pattern and the development of a plan to obtain the most effective drainage.

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Reservoir Performance Discussed by A. I. M. E.

(Continued from Page 19)

flow while the remaining 60 per cent permits only 11 per cent. From the practical standpoint, the method outlined is of importance in accounting for discrepancies that enter into permeability calculations.

In an address on the need for an engineering approach to gas-lift problems, C. E. Tweedle of Coastal Engineers, Houston, Tex., pointed out: first, that consideration must be given to the theoretical side to help build up a better understanding of the relationship of the variables involved in the process of gas lifting; second, that given the well characteristics and proper information on the power supply, an analysis can be made of the problem which will enable the engineer to design an installation and select equipment which will give satisfactory results. In the author's opinion, however, we cannot go much beyond simple thermodynamics in designing gas-lift installations, due to limited field data and facilities for carrying on experimental work.

Other papers delivered at the Friday sessions and not given with digests on Page 50 were: "The Unsteady Flow of Gas Through Unconsolidated Sand," by C. R. Hetherington, D. T. Roberts, and R. L. Huntington; "The Fitts Pool," by K. R. Teis; "The Relation of Linear Permeability to the Specific Productivity Index," by Frank M. Pool; and "Pressure Hydration Relationships in Heaving Shale," by H. H. Power, B. L. Fowle, and J. B. Plaza.

One of the outstanding entertainment features of the meeting was the Thursday evening party given by Mr. and Mrs. E. De Golyer at their home "El Rancho Encinal."

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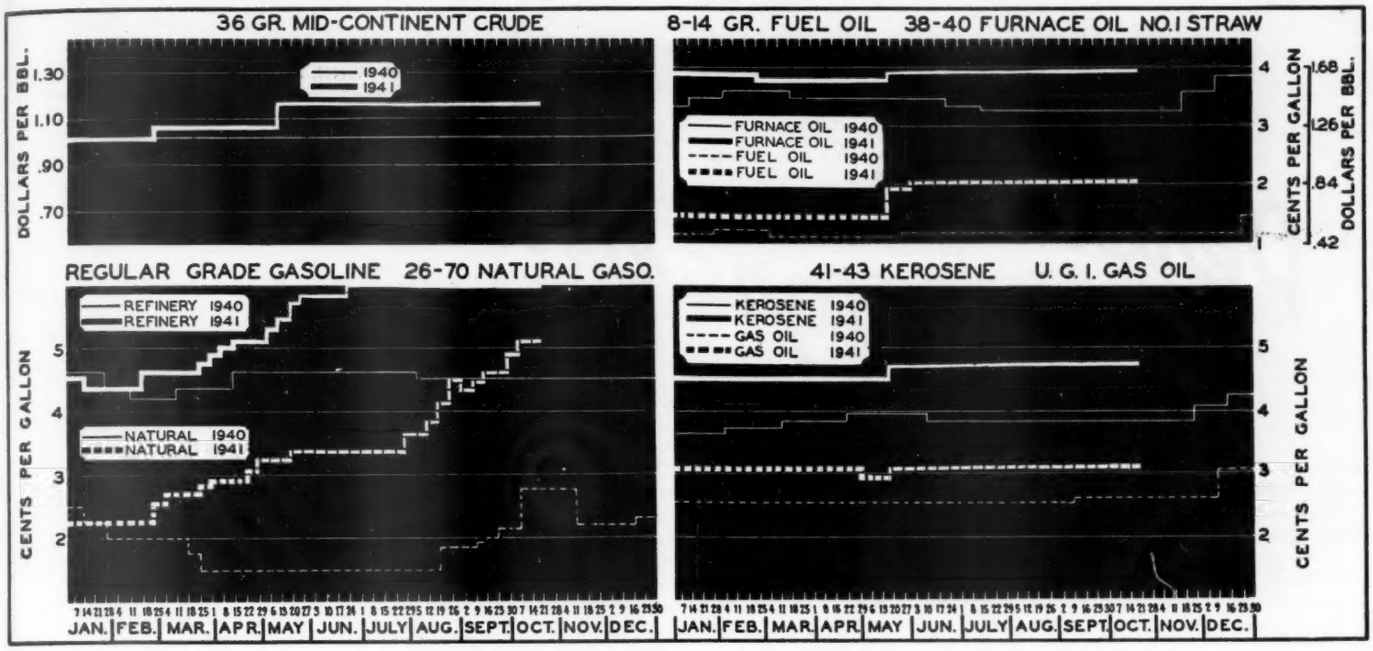
Ohio Fuel Gas Completes Line

Ohio Fuel Gas Co. has recently completed the laying of 31 miles of 12-in. high-pressure pipe line for natural-gas transmission across rugged terrain in Ohio. The work has been contracted by Anderson Brothers, pipe-line contractors.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Lend-Lease Demands May Be Filled From Regular-Customer Inventories

HOUSTON, Tex., Oct. 20.—Gulf Coast refiners this week are confronted with the possibility of an acute shortage of gasolines. Supplies on hand, as well as output of most plants for some time, are tied up on previous sales and commitments. Still, refiners were called upon to meet new and increasing lend-lease demands for material on the part of the U. S. Navy. Owing to the shortage of material, refiners have been unable to supply the latest request for lend-lease gasoline, bids on which were opened the past week. This request was for 2,000,000 bbl. for October delivery, but of this only 330,000 bbl. were offered. In the meantime, refiners have been called upon to obtain the release from former purchasers of as much undelivered material as possible in order to fill the requirements.

On the October delivery material taken on the bids last week, prices ranged from a minimum of $2.6675 per barrel (approximately 6.44 cents per gallon) to $2.835 per barrel (or approximately 6.75 cents per gallon). Specifications called for a minimum of 64 octane.

Separate from this material, Sinclair Refining Co. bid $2.81 per barrel or approximately 6.694 cents per gallon on three cargoes of 80,000 bbl. each for November delivery.

Additional lend-lease buying of diesel-index gas oils also was reported during the week with more than 530,000 bbl. of these oils being taken for October and November delivery. Minimum bids were 4.125 cents per gallon for 45-diesel-index oil.

Bunker C fuel oil showed additional strength during the week as new sales pushed quotations on the low side of the market up a nickel to 90 cents.

Mid-Continent Prices Holding Firm as Demand Remains Brisk

MID-CONTINENT markets held steady this week with demand for all products holding considerably above the normal seasonal expectancy. Refiners are selling considerably ahead of current production. Talk of higher crude prices is spreading into quarters previously silent and refiners are looking at this trend as an indication that raw-material costs may soon move upward.

The draft on Mid-Continent gasoline production for supplanting supplies in states on the western border of District 1 is one of the factors contributing to continued tightness of the market. Refiners are turning away inquiries with regularity because of their inability to fill commitments to old customers.

Pressure from Gulf Coast refineries on border markets served by the Mid-Continent has disappeared because of the lend-lease business accruing to Texas and Louisiana plants.

East Coast Refined-Oil Market Growing Firmer

NEW YORK, Oct. 21.—East Coast refined-oil prices were generally unchanged during the past week.

The Atlantic seaboard price structure, as affecting practically all products, is regarded as virtually frozen due to price administration implied or stated opposition to further increases. However, steadily rising delivery costs from eastern refineries and other advances in operating outlay establish a basis for higher prices.

At present, there is no material to be had which could be delivered to this area at a cost below the present prevailing price structure. Mexican suppliers are reported to have raised their selling prices considerably.

The present market for motor gasoline also is tight. The tanker shortage has, of course, affected the supply of all petroleum products here, and Gulf Coast refiners are in no position to provide Atlantic Coast buyers with material below current market levels, in view of the fact that they are now doing a heavy business both in the domestic and export trade.

Furthermore, the tanker shortage has fallen more heavily on the smaller dealers who have no tonnage of their own. Efforts of the local trade and the Government to allot tonnage evenly over the whole industry have been found practically impossible.

A.P.I. Weekly Refinery Statistics

Week Ended October 18, 1941

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	19,559,000	10,875,000	20,212,000	684,000
Appalachian	83.8	3,216,000	402,000	606,000	125,000
Ind., Ill., and Ky.	84.4	15,283,000	4,676,000	5,862,000	667,000
Okla., Kans., and Mo.	80.7	7,147,000	2,137,000	2,140,000	320,000
Inland Texas	63.2	2,298,000	1,423,000	571,000	149,000
Texas Gulf	91.0	11,055,000	9,215,000	6,358,000	995,000
Louisiana Gulf	94.2	2,664,000	2,069,000	1,838,000	156,000
N. Louisiana and Ark.	49.9	403,000	428,000	410,000	53,000
Rocky Mountains	50.1	1,006,000	325,000	127,000	55,000
California	90.9	14,538,000	62,875,000	12,929,000	550,000
Total reported	86.4	77,169,000	94,425,000	51,053,000	3,754,000
Est. unreported	.....	5,415,000	1,375,000	1,350,000	366,000
*Est. total	.....	†82,584,000	95,800,000	52,403,000	4,120,000
*Est. total previous wk.	.....	81,381,000	95,527,000	51,289,000	4,075,900
*Oct. 19, 1940	.....	80,414,000	107,236,000	48,943,000	3,525,000

*Bureau of Mines. †Includes 7,236,000 bbl. aviation gasoline.

Personal Paragraphs

C. E. RICHARDSON, Oklahoma City, Okla., has gone back to Benton, Ill., and is connected with Central Pipe Line Co., controlled by CHARLES SCOTT, at one time sales manager for Black Gold Refining Co.

JAMES S. NOLAND, head of the proration engineering division of Barnsdall Oil Co., addressed members of the Tulsa Kiwanis Club last week. He said that there is no present or immediate prospect of a shortage of crude oil thanks to the conservation programs the states and industry have developed.

EARL B. NOBLE, chief geologist of Union Oil Co., and Ted Miles, of the same company, recently left for South America and will be gone for several weeks.

THOMAS O. ALLEN, associate engineer in the Gulf Coast division for Humble Oil & Refining Co., has been transferred to the Anahuac district in Chambers County, Texas. as district petroleum engineer.

FRANK LOUY, who has been in the engineering office at the Falls City, Neb., field office for Ohio Oil Co., was recently transferred to the engineering department of the firm at Edmond, Okla.

CAPT. JAMES IRVINE, manager of the marine department of the Petrol Corp., was critically injured in a traffic accident in Mexico City which took the life of Mrs. Irvine and critically injured several others.

J. S. McCUNE, district petroleum engineer in the Conroe field for the Humble Oil & Refining Co., has been promoted to senior engineer and transferred to the Gulf Coast division offices at Houston, Tex.

F. C. HALL, Oklahoma oil producer, has purchased the residence of JACK DOYLE at Santa Monica for $65,000 and has taken possession. Mr. Hall sponsored the record-breaking flight of Wiley Post and Paul Gatty.

CHARLES S. JONES, president of Richfield Oil Corp., has returned to his Los Angeles office following a brief absence incident to the launching of Richfield's newest tanker, the Charles S. Jones, which was christened by Mrs. Jones at Sparrows Point Yard, Baltimore, Md.

HENRY W. BOGGESS, superintendent of safety for Sinclair Oil & Gas Co., Tulsa, was speaker on a Boy Scout program last week. His topic was "Health and Safety in Industry."

BERT McGUIGAN is superintendent of the merged South Central Texas and the North Central Texas districts of Texas Oil Corp., with offices in Wichita Falls. The Parks headquarters near Breckenridge in Stephens County will be eliminated with the retirement of JOE P. MERKT, who has been district superintendent for the past 20 years in that district.

A. F. WINN, traffic manager for Skelly Oil Co., Tulsa, for 18 years, has joined his office force in Kansas City, Mo., and will make that city his permanent residence. He has already moved to the Missouri city. The Skelly traffic department was moved to Kansas City 1½ years ago, but Mr. Winn remained in Tulsa to assist W. G. SKELLY in the operation of Spartan Aircraft Co.

HARVEY HERD, geologist for Standard Oil Co. of Texas, will succeed B. A. RAY, of Tide Water Associated Oil Co., as president of the Midland (Tex.) Geological Society. Other officers of the society elected at a recent meeting were: B. A. MARTIN, Gulf Oil Corp., vice president; EUGENE VANDERPOOL, Stanolind Oil & Gas Co., secretary-treasurer, and LANGDON TENNIS, independent geologist, speaker chairman.

ROBERT F. DAVISSON, of Grafton and Charleston, W. Va., has been appointed instructor in oil and gas engineering at the School of Mines of West Virginia University. Mr. Davisson was a graduate of the school of mines in the oil and gas option in the class of 1939. Following graduation he was employed with Pittsburgh Equitable Meter Co. in investigating and test work on gas-measurement meters and regulators. For the past 1½ years he has been employed as field gas engineer for West Virginia Public Service Commission.

STEFAN VON CROY, chief geophysicist for Barnsdall Oil Co., at Houston, Tex., has been transferred to the company's offices at Tulsa.

GEORGE ECHOLS, drilling contractor and independent producer at Houston, Tex., sold his airplane when his pilot, S. P. GELLY was called to the Army.

N. N. JONES, petroleum engineer for Humble Oil & Refining Co., formerly located in the London district, has been transferred to the East Texas division as senior engineer.

JOHN B. CARTER, independent operator and formerly vice president of the Gem Oil Co., at Houston, Tex., has moved to Illinois, where he will continue to operate as an independent.

R. H. HAWN, independent producer of Corpus Christi, Tex., was elected president and director of the Nueces County Water Improvement District 1 of Corpus Christi.

J. E. CLAYTON, gas-plant superintendent for Humble Oil & Refining Co. in the Flour Bluff field, has been transferred to the Lovells Lake repressuring plant as superintendent in charge.

ROBERT C. DAVIS, Davis Investment Co., California oil producer, and RICHARD FENTON, Alford Oil Co., have been appointed members of the executive committee of the National Stripper Well Association.

C. B. GARRETSON, of Los Angeles, Calif., has been appointed director of marketing for District 5 and the opening of offices in Los Angeles has been announced by Harold L. Ickes, petroleum coordinator for national defense.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Whether railroad companies may be compelled to furnish oil tank cars as demanded by shippers was argued before the Supreme Court at Washington.

L. L. Davis, field scout for the Gypsy Oil Co. in the Shamrock district, was in a runaway accident last week. He was thrown from a conveyance and suffered a fractured leg.

Josiah G. Winger, pioneer oil-well driller and one of the best known of the old-time residents of the oil country, died at Grand Valley, Pa., where he had made his home for the past 30 years. He was 71.

20 YEARS AGO

In a speech last week, Winston Spencer Churchill advised that the British do their buying and selling among themselves; that they promote active trade relations between the various countries constituting the British Empire.

Jess Willard, the former White Man's Hope, is now a Kansas oil operator.

The first use of helium, the noninflammable gas for inflation of an airship, will be undertaken by the Naval Bureau of Aeronautics within a few days.

10 YEARS AGO

The subject of bottom-hole pressures recently has been given considerable thought due to results obtained by the use of improved instruments. Some engineers urge that East Texas allowables should be based on this factor rather than on acreage.

Louis Walz, director in the Pennzoil Co. and one of the best known oil refiners in the East, died at his home in Oil City, Pa. He was 85 years old.

J. ELMER THOMAS, petroleum analyst of Fort Worth, Tex., has been appointed special assistant to Deputy Petroleum Coordinator Ralph K. Davies.

RUSSELL D. MAY, assistant proration supervisor for Stanolind Oil & Gas Co., has been moved from Houston, Tex., to Tulsa, where he will work under RALPH L. MAREK.

E. O. BENNETT, Ponca City, Okla., chief petroleum engineer of Continental Oil Co., will be a guest speaker at the monthly dinner of the Fort Worth Petroleum Engineers Club. The subject of his talk will be "Pressure-Maintenance Operations."

CHARLES DILLARD, of Effingham, Ill., production foreman for Carter Oil Co. in the St. Elmo district, is being transferred to Plaquemine, La., as district superintendent for Carter. Mr. Dillard will leave for Louisiana this week.

JAMES A. LEWIS, of Core Laboratories, Inc., Dallas, Tex., addressed the members of the Fort Worth Geological Society at their weekly luncheon. With lantern slides he presented an interesting discussion on "Interpretation of Core Analysis."

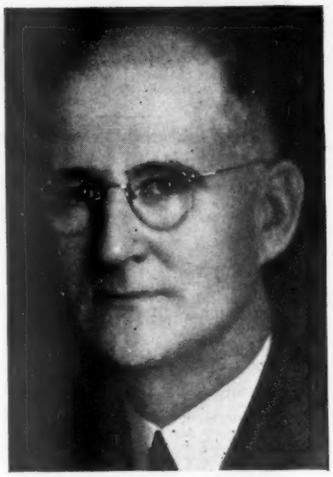
G. A. RUSSELL, a member of the geological department of Stanolind Oil & Gas Co., Tulsa, has resigned to become principal topographic engineer at the Puget Sound Navy Yard at Bremerton, Wash. He left last Friday for his new home.

EDWARD STEWART, of Mount Pleasant, Mich., a veteran oil man, has been appointed to the Michigan Oil Advisory Board. He fills a vacancy created by the resignation of C. A. SMITH, formerly of Grand Rapids, who has moved out of the state.

J. K. HUFENDICK, district superintendent at Oklahoma City, Okla., for the Texas Co., discussed the importance of the Barco concession in the world oil picture before the Oklahoma City Geological Society on Monday. Mr. Hufendick spent 3 years in the district, having but recently returned.

Receives High Honors

Long a leader in the petroleum industry, John F. O'Donohoe, Wichita Falls, Tex., was given one of the two distinguished-service awards of the Texas Mid-Continent Oil and Gas Association at its Beaumont convention last week, as L. P. Garrett, vice president of the Gulf Oil Corp., Houston, paid tribute to the North Texas oil man for his many services to the industry.



JOHN F. O'DONOHOE

As is the custom of the Texas Mid-Continent, two awards are given at each convention, one being presented to an integrated-company official by a producer, and the other being given a producer in a speech of presentation by an integrated-company official.

Mr. O'Donohoe, president of the Petroleum Producers Co., formerly was president of the Texas Mid-Continent Oil and Gas Association and of the North Texas Oil and Gas Association. He is now a director and member of the executive committee of the Independent Petroleum Association of America, president of the Hardin Junior College board, and director of the First National Bank of Wichita Falls.

Born October 19, 1885, at Gautier, Miss., he was educated in the parochial schools of Algiers, La., and Holy Cross College, New Orleans. He entered the oil business at the age of 19, having been in it continuously since then.

His first oil-company connection was from 1904-09 with the Evangeline Oil Co., of Lafayette, La., as manager of a loading rack. In 1909 he joined the J. M. Guffey Petroleum Co., later the Gulf, at Wichita Falls, as a scout, serving until 1916 when he went with the Texas Co. at Wichita Falls as head of its land and lease department there.

In 1918 he joined the Wichita Falls Fuel & Development Co. as general manager. In 1919 he became manager of the United Producers Co., and in 1920 became associated with the Cline Oil Co. A year later he was made president of the Petroleum Producers Co., which he has been instrumental in building up in the years since.

He is married, his wife being the former Miss Carrie Kell of Wichita Falls, and they have one son, Jack.

J. E. SEIGLER, production foreman in Osage County, Oklahoma, for Pure Oil Co., is now similarly engaged in the Cumberland field, Oklahoma.

O. V. TWOMBLY, who has served Ohio Oil Co. at its Tulsa and Oklahoma City, Okla., offices, is now stationed in the enlarged offices at Shreveport, La.

L. C. HALPENNY, formerly in the mining business at Safford, Ariz., is now petroleum engineer for the New Mexico district of Ohio Oil Co., with station in Hobbs.

BERNARD B. HAYS, who has been land man in the Louisiana-Arkansas-Mississippi area for Skelly Oil Co., with offices in Shreveport, La., is now stationed in Tulsa.

AL BUCHANAN, San Antonio, Tex., oil man, has been named chairman of a newly appointed permanent petroleum committee of the South Texas Chamber of Commerce.

C. P. BRUNETTE, of Gulf Oil Corp., Odessa, Tex., was crowned champion safe driver by the National Safety Council at its recent meeting. He has driven a truck for Gulf a total of 592,730 miles without an accident.

JOHN A. HAYS has been appointed plant superintendent for Community Natural Gas Co., Wichita Falls, Tex., succeeding the late E. J. Fisher. Mr. Hayes entered the gas industry in 1927 in the construction department.

C. L. BARRETT, Gulf Oil Corp., Tulsa, has been named chairman of the Mid-Continent section of the petroleum division of the National Safety Council. R. S. HUFFMAN, Oklahoma Natural Gas Co., Tulsa, was named chairman of the publicity committee.

W. L. JAMES, purchasing agent for the Stanolind companies in Tulsa, and who is consultant on purchasing to the OPM in Washington, flew into Tulsa to spend last week end with his family and at his desk. He returned to Washington early this week.

Shifts: B. M. BRADLEY, engineer, Continental Oil Co., from Wasco, Calif., to Colorado Springs, Colo.; O. L. CHENOWETH, engineer, Gulf Oil Corp., from Crane, Tex., to Austin, Tex.; A. R. BURCH, superintendent, W. B. Hinton, from Mount Pleasant, Tex., to Lockhart, Tex.; R. M. SWESNIK, engineer, Tex Harvey Oil Co., from Dallas, Tex., to Palestine, Tex.; J. F. DARBY, president, Darby Lynde Co., from Colorado Springs, Colo.; to Muskogee, Okla.; CHARLES W. DREW, engineer, Paine Webber & Co., from Minneapolis, Minn., to Moose Jaw, Sask.; THAD HOKE, superintendent, Fain-Porter Drilling Co., from Bartlesville, Okla., to Tulsa; R. B. CHESNEY, engineer, Cities Service, from Oklahoma City, Okla., to Seminole, Okla.; C. A. BALDWIN, engineer, Baldwin Oil Co., from Salem, Ill., to Mount Vernon, Ill.; SAMUEL BUTLER, JR., engineer, Texas Co., from West Chester, Pa., to Houston, Tex.; W. E. GIBSON, superintendent, Warren-Bradshaw Drilling Co., from Great Bend, Kans., to Apache, Okla.; ELMER M. NOVAK, president, Kavon Oil Co., from Tulsa, to Salem, Ill.

HARRY S. MOSS, president of the H. S. Moss Petroleum Co., Imperial Petroleum Co., Westway Production Co., Stuart Petroleum Co., and Moss Oil & Gas Co., has been elected member of the board of directors of the First National Bank, Dallas, Tex. Mr. Moss entered the oil business in 1908 in California, and went to Wichita Falls, Tex., in 1919.

JULIEN B. HARRIS, of the traffic department of Continental Oil Co., at Fort Worth, Tex., is scheduled for transfer to Houston, Tex., where a traffic and accounting department will be opened by Continental at its division marketing office there.

W. G. CORWIN, vice president of the Colombian Petroleum Co., and Mrs. Corwin sailed on October 17 for Colombia on the Grace liner Santa Paula. Sailing on the same ship were Dr. and Mrs. OCTAVIO V. CALCANO. Dr. Calcano is connected with the legal department of the Standard Oil Co. of Venezuela. Mrs. H. M. Hoberg, wife of the assistant general manager of the Standard Oil Co. of Venezuela, was also a passenger.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of October 21, 1941

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline Tank wag.	Gasoline Dlr.	Gasoline Inc. tax	Kero. tank wag.
Chicago, Ill.	16.1	14.1	4.5	10.3
Decatur	15.4	13.4	4.5	9.5
Joliet	16.4	14.1	4.5	10.3
Peoria	16.2	13.7	4.5	10.1
Quincy	13.4	12.4	4.5	10.0
Davenport, Ia.	16.2	14.7	4.5	10.1
Des Moines	15.9	11.9	4.5	9.8
Mason City	16.2	14.7	4.5	10.1
Duluth, Minn.	17.7	16.2	5.5	10.6
Mankato	17.4	15.9	5.5	10.3
Minneapolis	17.4	15.9	5.5	10.3
La Crosse, Wis.	17.4	15.9	5.5	10.3
Green Bay	17.7	16.2	5.5	10.6
Milwaukee	17.6	16.1	5.5	10.5
Detroit, Mich.	15.9	14.4	4.5	9.6
Grand Rapids	15.9	14.4	4.5	9.6
Saginaw	15.9	14.4	4.5	9.6
Evansville, Ind.	16.9	15.4	5.5	9.6
Indianapolis	17.1	15.2	5.5	9.8
South Bend	17.5	16.0	5.5	10.2
Fargo, N. D.	18.4	16.9	5.5	11.3
Huron, S. D.	17.8	16.3	5.5	10.7
Kansas City, Mo.*	14.9	13.4	4.5	9.4
St. Louis*	14.8	13.3	4.5	9.8
St. Joseph	15.7	14.2	4.5	9.6
Wichita, Kans.	14.8	12.7	4.5	8.0

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers. On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off, minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective Sept. 18, 1941, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-149 gal., 7.5 cents; 150-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-149 gal., 7.5 cents; 150-399 gal., 7.5 cents; 400 gal. and over 7.0 cents. Stanolex fuel oil A, 1-99 gal. 8.0 cents; 100-399 gal., 7.0 cents; 400-749 gal., 6.0 cents, 750 gal. and over, 5.25 cents. Stanolex fuel oil B, 1-99 gal., 8.0 cents; 100-399 gal., 7.0 cents; 400-749 gal., 6.0 cents; 750 gal. and over 5.25 cents. Stanolex Bunker C fuel oil, 1-399 gal., 6.5 cents; 400-999 gal., 5.5 cents; 1,000 gal and over, 4.5 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Cons'r tank wag.	Gasoline Di-vided dlr.	Gasoline Inc. tax	Kero. tank wag.
Ohio points	16.0	15.0	5.5	*9.0

*Includes state tax of 1 cent.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline Cons'r tank wag.	Gasoline Net dlr.	Gasoline Inc. tax	Kero. tank wag.
Atlanta, Ga.	18.00	18.00	7.5	10.0
Augusta	18.00	18.00	7.5	9.5
Macon	18.00	18.00	7.5	10.0
Savannah	17.00	17.00	7.5	9.0
Birmingham	18.50	18.50	8.5	8.0
Mobile	18.50	18.50	9.5	8.5
Montgomery	19.50	19.50	9.5	10.0
Jackson, Miss.	17.50	17.50	7.5	9.0
Vicksburg	17.00	17.00	7.5	8.5
Jacksonville, Fla.	18.00	18.00	8.5	8.0
Miami	18.00	18.00	8.5	8.0
Pensacola	18.50	18.50	9.5	8.0
Tampa	18.00	18.00	8.5	8.0
Lexington, Ky.	17.00	17.00	6.5	9.0
Covington	16.0	16.0	6.5	9.0
Louisville	16.50	16.50	6.5	8.5
Paducah	16.50	16.50	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Cons'r tank wag.	Gasoline Dlr. tank wag.	Gasoline Inc. tax	Kero. tank wag.
Atlantic City	13.5	14.0	4.5	7.9
Newark	13.5	14.0	4.5	7.9
Annapolis	14.85	15.35	5.5	9.7
Baltimore	14.25	14.75	5.5	8.7
Cumberland	15.65	16.15	5.5	10.2
Washington, D. C.	12.50	13.00	3.5	9.2
Danville, Va.	16.95	17.45	6.5	10.45
Norfolk	15.75	16.25	6.5	10.2
Petersburg	16.05	16.55	6.5	11.2
Richmond	16.05	16.55	6.5	11.2
Roanoke	17.25	17.75	6.5	10.7
Charles'n, W. Va.	17.55	18.05	6.5	11.5
Parkersburg	16.85	17.35	6.5	11.5
Wheeling	16.85	17.35	6.5	11.8
Charlotte, N. C.	18.40	18.90	7.5	9.5
Hickory	18.95	19.45	7.5	10.5
Mount Airy	18.80	19.30	7.0	9.7
Raleigh	18.15	18.65	7.0	10.5
Salisbury	18.45	18.95	7.5	10.9
Charleston, S. C.	17.25	17.75	7.5	(*)
Columbia	18.10	18.60	7.5	(*)
Spartanburg	18.80	19.30	7.5	(*)

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connections, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery: 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

*Kerosene business of the company at these points now exclusively handled by dealers.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline Cons'r tank car	Gasoline Dlr. tank wag.	Gasoline Inc. tax	Kero. tank wag.
Philadelphia, Pa.	14.0	15.0	5.5	10.15
Pittsburgh	14.5	15.5	5.5	10.5
Allentown	14.5	15.5	5.5	10.5
Erie	14.5	15.5	5.5	10.5
Scranton	14.5	15.5	5.5	10.5
Altoona	14.5	15.5	5.5	10.5
Dover, Del.	...	15.5	5.5	10.5
Wilmington	...	15.0	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank truck* wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
San Francisco	14.5	18.5	4.5	11.5
Los Angeles	14.0	18.0	4.5	10.0
Fresno, Calif.	15.5	19.5	4.5	12.5
Phoenix, Ariz.	18.5	22.5	6.5	12.5
Reno, Nev.	17.5	21.5	5.5	13.5
Portland, Ore.	17.0	21.0	6.5	13.5
Seattle, Wash.	17.0	21.0	6.5	13.5
Spokane	19.0	23.0	6.5	16.5
Tacoma	17.0	21.0	6.5	13.5

*Posted net tank-truck prices (including tax).

Resale and commercial discounts, effective October 1, 1941: Tank-car deliveries 0.25 cent a gallon off posted net tank truck. Commercial: Retail deliveries, and/or tank-truck deliveries of less than 40 gal., 4 cents per gallon above posted net tank-truck price for Standard Aviation, Standard's Supreme, and Standard Gasoline, and 3 cents per gallon above posted net tank truck for Flight Gasoline, except single deliveries of less than 40 gal. to marine trade only, which are billed at posted net tank-truck price.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Comm. tank wag.	Gasoline Dlr.* tank wag.	Gasoline Inc. tax	Kero. tank wag.
Albany	14.2	14.7	5.5	7.7
Met. New York	14.4	14.9	5.5	8.0
Buffalo	14.5	15.0	5.5	8.3
Rochester	15.1	15.6	5.5	8.8
Syracuse	14.8	15.3	5.5	8.7
Portland, Me.	14.6	15.1	5.5	8.1
Manchester, N. H.	15.6	16.1	5.5	9.0
Burlington, Vt.	15.2	15.7	5.5	8.3
Boston, Mass	13.2	13.7	4.5	8.0
Worcester	13.8	14.3	4.5	8.1
Hartford, Conn.	13.9	14.4	4.5	7.6
New Haven	13.3	13.8	4.5	6.9
Providence, R. I.	13.3	13.8	4.5	7.8

*Undivided.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Gasoline Inc. tax	Kero. tank wag.
Denver, Colo	14.5	5.5	11.0
Grand Junction	18.0	5.5	12.5
Pueblo	14.5	5.5	9.5
Casper, Wyo.	17.0	5.5	12.0
Cheyenne	16.0	5.5	11.5
Billings, Mont.	18.0	6.5	12.5
Butte	17.0	6.5	13.5
Great Falls	17.0	6.5	12.5
Helena	17.0	6.5	13.0
Salt Lake, Utah	18.5	6.5	14.5
Boise, Idaho	†20.1	6.5	16.5
Twin Falls	†21.1	6.5	17.0
Albuquerque, N. M.	*17.5	7.0	10.0
Roswell	*15.5	7.0	8.5
Santa Fe	‡18.0	7.5	10.0

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Gasoline Incl. tax	Kero. tank wag.
Texarkana, Ark.	14.0	5.5	6.0
Fort Smith	15.5	7.0	6.5
Little Rock	17.25	8.0	8.0
Muskogee, Okla.	15.0	7.0	8.0
Oklahoma City	15.0	7.0	8.0
Tulsa	15.0	7.0	8.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Cons'r tank wag.	Gasoline Dlr. tank wag.	Gasoline Incl. tax	Kero. tank wag.
New Orleans, La.	17.25	17.50	8.5	‡10.0
Baton Rouge	17.25	17.50	8.5	‡10.5
Alexandria	17.25	17.50	8.5	‡10.5
Lafayette	17.50	18.00	8.5	‡10.0
Lake Charles	17.50	18.00	8.5	‡12.0
Shreveport	17.00	17.0	8.5	10.0
Knoxville, Tenn.	20.00	20.50	8.5	12.5
Memphis	18.25	18.75	8.5	10.5
Chattanooga	19.00	19.5	8.5	11.0
Nashville	19.00	19.5	8.5	10.0
Bristol	18.25	18.75	8.5	12.0

Esso at dealer price less 0.5 cent per gallon to undivided dealers.

‡Includes 1-cent state tax.

Price basis to commercial consumers throughout Louisiana, Arkansas, and Tennessee: On single deliveries of 50 gal. or more at a time—posted consumer tank-wagon price. On single deliveries of less than 50 gal. at a time—posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price is the same as the posted dealer tank-wagon price, less 0.5 cent per gallon.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank wag.	Gasoline Dlr.	Gasoline Incl. tax	Kero. tank wag.
Omaha	17.9	15.4	6.5	9.3
McCook	18.5	15.9	6.5	9.5
Norfolk	18.4	16.9	6.5	10.3
North Platte	18.8	16.4	6.5	10.7
Scottsbluff	18.9	16.0	6.5	9.5

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Incl. tax	Kero. tank wag.
Dallas, Tex.	14.0	17.0	5.5	7.0
Fort Worth	14.0	17.0	5.5	7.0
Houston	14.0	18.0	5.5	8.0
San Antonio	14.0	18.0	5.5	7.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada*

3-Star Imperial Gasoline

IMPERIAL OIL, LTD.

	Gasoline Tank wag.	Gasoline Incl. tax	Kero. tank wag.
Halifax, N. S.	29.5	13.0	19.0
St. John, N. B.	29.5	13.0	19.0
Montreal, Que.	28.0	11.0	17.5
Toronto, Ont.	28.5	11.0	18.0
Hamilton, Ont.	28.5	11.0	18.0
Winnipeg, Man.	30.5	10.0	22.5
Brandon, Man.	31.0	10.0	23.0
Regina, Sask.	28.0	10.0	20.0
Saskatoon, Sask	30.8	10.0	22.8
Edmonton, Alta.	28.9	10.0	20.9
Calgary, Alta.	26.0	10.0	18.0
Vancouver, B. C.	25.0	10.0	24.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In Maritime Provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Standard Oil Co. of Nebraska reduced the tank-wagon price of kerosene 0.5 cent per gallon at Scottsbluff, Neb., effective September 6.

Mississippi Fields

(Continued from Page 100)

at 468 ft., and the St. Peter at 1,140-53 ft.

ALABAMA COMPLETION

Wildcat, Madison County: Mellen & Thompson 1 Alice Baldridge, NE NE NW 8-1s-1e, top Silurian 11 ft., Ordovician 90 ft., Stone River 468 ft., St. Peter 1,140-53 ft., dry at 1,172 ft.

ALABAMA ACTIVE WILDCATS

Clarke County: Union 1 M. M. Waite, C NW 27-8n-1w, drilling 12,351 ft.

Fayette County: J. W. Mills 1 W. C. Musgrove, C NW 10-15s-12w, T.D. 1,495 ft., fresh water, show gas, fishing.

Franklin County: E. O. Heath, Jr., 1 W. O. Hester, SW SW 4-6s-12w, drilling 1,430 ft.

Lauderdale County: G. F. Mercer 1 Patterson, NW SE 8-2s-12w, drilling 1,905 ft.

Madison County: E. O. Heath and W. W. Newman 1 Cambron, SE SE SE 35-5s-6e, T.D. 280 ft., bailing 7 gal. oil per hour, treated 1,000 gal. acid, seat broke and flooded sand, S.D.O.

Monroe County: Vaughn & Andrade 1 W. S. Moore est., C NW 27-7n-5e, moving in material.

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of October 21, 1941
(Most prices in cents per gallon)

The quotations are exclusice of the federal excise taxes of 1.5 cents a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.06	.0625
63-66 octane	.05625	.05875
60 octane and below	.0525	.055
60-62 400 grades:		
72-74 octane (regular)	.06	.0625
63-66 octane	.05625	.05875
60 octane and below	.0525	.055

NORTH TEXAS—

U. S. Motor grades:		
72-74 octane (regular)	.05875	.06125
63-66 octane	.0550	.06
60 octane and below	.05125	.05375
60-62 400	.05	.06

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
72-74 octane (regular)	.05875	.06125
63-66 octane	.0550	.05875
60 octane and below	.05	.06

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
72-74 octane (regular)	.05875	.06125
60 octane and below	.05	.05375

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.06	.0625
63-66 octane	.05625	.05875
60 octane and below	.0525	.055
60-62 400 grades:		
72-74 octane (regular)	.06	.0625
63-66 octane	.05625	.05875
60 octane and below	.0525	.055

PENNSYLVANIA (inland refineries)—

74-76 octane (regular)	.0750	.0775
80 octane (1939 Research)		.0800

CALIFORNIA (domestic movement)—

58-60 400, 65 oct. and higher	.065	.0725
54-58 U. S. Motor	.0575	.0625

EAST COAST (domestic)—

U. S. Motor (minimum 72 octane):		
New York (Bayonne)*	.08	.085
Philadelphia	.08	.0825
Boston	.085	.09
Baltimore	.08	.0825
Charleston, S. C.	.0725	.0775

*All grades of gasoline ½ to ¾ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
80 plus (research)	.06625	.0675
72-74 octane (leaded)	.0625	.06375
70-72 octane (unleaded)	.0625	.0650
68-70 octane (unleaded)	.0625	.0650

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.05125
Grade 18-55	.06125	.0625

NORTH TEXAS—

Grade 26-70		.0475
Grade 18-55	.05625	.0575

CALIFORNIA—

75-85 375-390	.045	.05

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.0475

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p. 110-flash, 540-550 e.p.	.0375	.03875
41-43 gr., 300-320 i.b.p. 110-125 flash, 500-520 e.p.	.03875	.04
46-48 gr., 210-230 i.b.p. 480 max., e.p.	.04125	.0425

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44	.0450	.0475
41-43	.04375	.04625

NORTH TEXAS—

41-43	.0425	.04625

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04375	.04625

ARKANSAS (Ark. and N. La. del.)—

41-43	.04375	.04625

PENNSYLVANIA (inland refineries)—

46	.0625	.06625
45	.0625	.065

CHICAGO (Based on Group 3)—

42-44	.0450	.0475
41-43	.04375	.04625

CALIFORNIA (Pac. Coast market)—

38-40 high-burning test	.045	.055

NEW YORK (Bayonne, N. J.)—

41-43		.055

GULF COAST (domestic)*—

41-43	.04	.04125

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.04	.0425
No. 1 white (38-42)	.03875	.04125
No. 2 straw (32-36)	.0350	.0375
No. 3 zero to 10 (28-32)	.03375	.03625

NORTH TEXAS—

No. 1 white (38-42)	.03825	.04125

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2 (32-36)	.0325	.035

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	.0325	.035

CHICAGO (Based on Group 3)—

Range oil	.04	.0425
No. 1 white (38-42)	.03875	.04125
No. 2 straw (32-36)	.035	.03625
No. 3 zero to 15 (28-32)	.03375	.035

NEW YORK (Bayonne, N. J.)—

*No. 1		.055
*No. 2	.051	.0525
*No. 3	.051	.0525

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

No. 5, low pour point (18-22)	.85	.90
No. 6, 15 and above (10-16)	.85	.90

NORTH TEXAS—

No. 5, low pour point (18-22)	.80	.85
No. 6, 15 and above (10-16)	.80	.85

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.80	.85

CHICAGO (Based on Group 3)—

No. 5, low pour point (18-22)	.85	.90
No. 5, 15 and above (18-22)	.85	.90
No. 6, low pour point (10-16)	.85	.90
No. 6, 15 and above (10-16)	.85	.90

PENNSYLVANIA (inland refineries)—

36-40	.05875	.0625

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.10	1.25
24 plus diesel, per bbl.	1.10	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.75	.85
10-16 (cargo lots)	.75	.85
12-17 (tank cars)	.65	.75
10-17 (high sulfur)	.55	.65
San Joaquin Valley:		
10-18 (tank cars)	.70	.85
24 plus diesel, per bbl.	1.10	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.80	.85

GULF COAST—

No. 2 fuel		.04
43-47 diesel		.04125
48-52 diesel	.04125	.0425
53-57 diesel		.0425
58-and-above diesel	.0425	.04375
Diesel bunkers		1.45
Bunker C (bulk cargoes)		.90
Bunker C (bunkers)		.85

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.050
28-30 diesel (lighterage 6¼c per bbl.)		2.15
28-30 diesel (tank cars)		.05
Bunker C (to ocean-going ships in N. Y. Harbor)	1.35	1.45
Industrial fuel (tank cars)		.044

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.27
150-160 D, 0-10		.23
150-160 D, 10-25		.225
120-125 D, 0-10		.225
120-125 D, 10-25		.22
Steam refined:		
600 dark green (untreated)		.145

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.305
15 pour point		.295
25 pour point	.25	.28
Steam refined:		
600	.15	.16
650	.155	.165
600 flash	.16	.18
630 flash	.17	.185

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.145
180-3		.15
200-3		.15
250-3		.165
280-3		.175
280-4		.17
300-3		.185
350-3½		.19
400-3½		.20
500-3½		.205
600-3½		.21
100-2½ paraffin oil 10-25		.0825
10-25 pour point:		
200-3		.145
250-3		.16
280-3		.17
280-4		.165

CALIFORNIA (moving to dom. mkt.)—

Pale oils:		
200-2½-3	.07	.0775
300-2½-3	.07	.0775
400-3-4	.0725	.08
450-3-4	.0725	.08
550-3-4	.0875	.1075
600-3-4	.0875	.11
Red oils:		
200-4-5	.07	.0775
300-5-6	.0725	.08
350-5-6	.09	.11
400-5-6	.09	.11
450-5-6	.09	.1125
500-5-6	.0925	.1125
600-5-6½	.0925	.1125
700-6½ plus	.0925	.1125
750-6½ plus	.0925	.1125
900-6½ plus	.0925	.1125

GULF COAST—

Pale oils:		
100-3	.0625	.0650
200-3	.0850	.0875
300-3	.09	.0925
500-3½	.0975	.10
750-3½	.10	.1025
1,200-3½	.1025	.10375
2,000-4	.1050	.1075
3,000-4	.1225	.1250

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		.385
10 pour point		.375
15 pour point		.365
25 pour point		.31
200 vis., at 70° F., 3 color:		
Zero pour point		.405
10 pour point		.395
15 pour point		.385
25 pour point		.33

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.06	.06125

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale		.0625
124-126 (A.m.p.) w.c. scale		.0625

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax	.0560	.0640
128-130 (A.m.p.) wax	.0560	.0660
130-132 (A.m.p.) wax		.0585
133-135 (A.m.p.) wax		.0615
135-137 (A.m.p.) wax		.0640
Crude scale:		
124-126 (A.m.p.) w.s.		.0625
124-126 (A.m.p.) y.s.		.0625
Petrolatum in barrels, carload lots:		
Dark green		.02875
Amber	.02875	.03125
Extra amber	.03125	.03375
Lily white	.04875	.05375
Snow white	.05625	.05750
Cream	.04125	.05250

Export Prices

GASOLINE

GULF COAST—

60-62 400	.0550	.0675
61-63 390	.0575	.0650
64-66 375	.0575	.0650

LOS ANGELES—

U. S. Motor grades:		
Above 60 octane	.06	.0625
65-69 octane	.0575	.06
60-65 octane	.0525	.055

KEROSENE

GULF COAST—

41-43 water white	.0375	.04

LOS ANGELES—

41-43 water white	.05	.0525

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbl.)—

Cylinder stocks:		
600 S.R. unfiltered		.23
630 S.R. unfiltered		.235
600 flash, S.R.		.24
650 flash, S.R.		.25
Bright stock:		
Light, 25 pour point	.34	.35

NEUTRAL OIL

200-3 color	.43	.50
150-3 color	.41	.46

PARAFFIN WAX

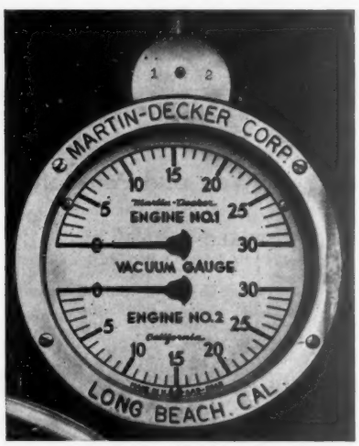
NEW YORK (prices per bbl.)—

123-125 A.m.p.	.0560	.0625
125-127 A.m.p.	.0560	.0625
128-130 A.m.p.	.0585	.0650
133-135 A.m.p.	.0615	.0700
135-137 A.m.p.	.0640	.0700
Crude scale:		
124-126 w.s.		.0625
124-126 y.s.		.0625

EQUIPMENT PROGRESS...

Vacuum Gage for Spark Plug Rigs Is Developed

A two-element vacuum gage—one element for each engine on a spark-plug drilling rig—is a new development recently announced by Martin-Decker Corp., Long Beach, Calif. This unit replaces the steam-torque gage on the Sealtite drilling control, permitting an accurate check to be kept on the amount of torque or work expended by each engine while drilling, and



also aiding in maintaining the most efficient engine speeds. On a normal two-engine hookup, one element of the gage is connected to the manifold of the draw-works rotary-table engine, the other to the engine driving the power pump. (The latter engine is coupled with the rotary-table engine when bringing drill pipe out of the hole.)

Gage readings with the instrument are in "inches of vacuum," and an important use of the unit is in checking the amount of work being done by the engines during various drilling functions. For example, with the pump engine registering 3 in. vacuum and the draw works-table engine registering 8 in., an overload on the pump engine would be indicated. Steps could then be taken to correct the overload by checking carburetor gaskets for leaks, gearing the engine down, or installing greater power—thus reducing engine wear and tear. On rigs using three engines, the vacuum-gage connection is installed only on the draw works and rotary-table engines to obtain load readings.

The Martin-Decker vacuum-gage dial is installed in the Sealtite drilling-control instrument board right before the driller, and the two gage hands permit direct readings to be made on each engine individually. The recorder is attached to the No. 1 engine gage only. The mechanism is calibrated to indicate and record 30 in. of vacuum at sea level. When the engine (if in good condition) is idling, the gage will indicate approximately 21 in. For each thousand feet above sea level that the rig is located, 1 in. of vacuum should be deducted from the readings.

TRADE LITERATURE

NORTON CO., Worcester, Mass. — A handbook, "Grinding Carbide Tipped Tools," on reconditioning and sharpening single point cemented carbide tools rapidly and economically. A handy pocket size, the booklet is well illustrated and contains complete diagramatic and descriptive material for a wide variety of operations.

MERCO NORDSTROM VALVE CO., 400 Lexington Avenue, Pittsburgh, Pa.—Catalog V-139, consisting of 104 pages, plastic bound, and presenting 98 Nordco steel valves and 121 semi-steel valves. Each valve illustrated is accompanied by full specifications, range of sizes, dimensions, working and test pressure or A.S.A. ratings, methods of operation and notes regarding flanges, templates, etc. Cross-sectional views of the basic types of Nordstrom valves are shown. It is the first time all Nordstrom valves used in refinery operations have been presented in one volume. A wealth of diagrammatic and tabular engineering material is also included.

R. W. RHOADES METALINE CO., Long Island City, N. Y.—A catalog describing Metaline oilless bronze bearings has just been issued. Copies may be had on request.

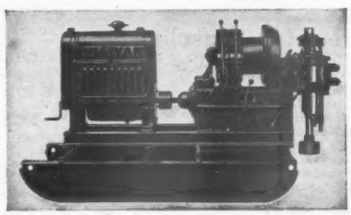
BROWN INSTRUMENT Co., Wayne and Roberts Avenues, Philadelphia, Pa.—Bulletin 74-2, "Brown Furnace Pressure Controller," consisting of 8 pages, telling "How," "Why," "When" and "Where" Brown furnace pressure controllers can be used to maintain constant furnace pressure automatically. A complete description of the control system is given and also of the parts that go to make up the system, such as the indicating controller, power cylinder and diaphragm motor. Large, clear photographs of the units are also included. A schematic diagram shows how the system should be hooked up for operation.

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis.—Bulletin B-6047, giving full descriptions of Allis-Chalmers Texsteel and Texdrive sheaves—steel and cast-iron sheaves for Texrope drives from fractional to 25 hp. Handy tables in the book list available sizes, various dimensions and list prices. A section is also devoted to the new Texrope Super-7 V-belts.

HOBART BROTHERS CO., Troy, Ohio.—A new 38-page catalog describing the complete line of Hobart "Simplified" arc welders and accessories will be sent free upon request.

New Sullivan Core Drill Built for Heavy Duty

A new heavy-duty core drill—the No. 22-HD—is offered by the Sullivan Machinery Co., Michigan City,



Ind. It is adaptable for coal and mineral prospecting, oil-field service, or testing foundations for heavy construction. This modern drill is built for surface drilling under the toughest of operating conditions, and is conservatively rated at 1,750-ft. capacity with "E" rods.

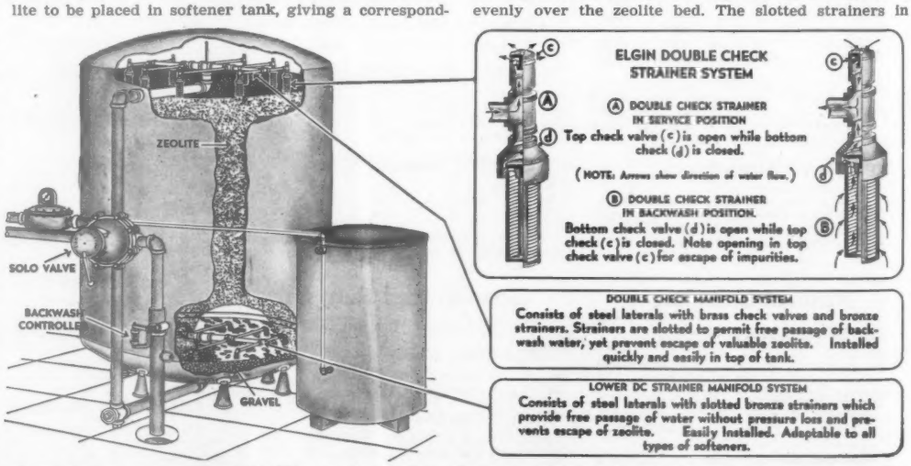
The No. 22-HD core drill is a direct-driven machine with power unit connected to the drilling head through the four-speed automotive-type transmission by means of a clutch. The built-in clutch allows the use of any power unit having a stub shaft (electric, gasoline, or diesel) if operating characteristics are suitable. Controls are conveniently grouped, all gears are enclosed, and a hand-lever safety clutch permits the runner to stop the rotation of the beveled drive gear when the swivelhead is open while running or pulling rods.

The swivelhead, large hoisting drum, transmission, clutch, and power unit are mounted on rigid skid base. The unit can be quickly dismantled into four main parts for muleback transportation.

It is described in Bulletin D-28.

ELGIN SOFTENER USES NEW SYSTEM TO CONTROL WATER

Elgin Double Check softeners, offered by Elgin Softener Corp., Elgin, Ill., are built on a new principle of controlling the distribution and flow of water in a zeolite softener. Double-check system of valves and manifolds permits as much as 35 per cent more zeolite to be placed in softener tank, giving a corresponding increase in capacity. Zeolite loss is prevented; faster, cleaner backwashing is obtained; packing and channeling is prevented; regenerating brine is applied thoroughly, using less salt.


ZEOLITE
SOLO VALVE
BACKWASH CONTROLLER
GRAVEL
ELGIN DOUBLE CHECK STRAINER SYSTEM
(A) DOUBLE CHECK STRAINER IN SERVICE POSITION
Top check valve (c) is open while bottom check (d) is closed.
(NOTE: Arrows show direction of water flow.)
(B) DOUBLE CHECK STRAINER IN BACKWASH POSITION.
Bottom check valve (d) is open while top check (c) is closed. Note opening in top check valve (c) for escape of impurities.
DOUBLE CHECK MANIFOLD SYSTEM
Consists of steel laterals with brass check valves and bronze strainers. Strainers are slotted to permit free passage of backwash water, yet prevent escape of valuable zeolite. Installed quickly and easily in top of tank.
LOWER DC STRAINER MANIFOLD SYSTEM
Consists of steel laterals with slotted bronze strainers which provide free passage of water without pressure loss and prevents escape of zeolite. Easily installed. Adaptable to all types of softeners.

A detailed cutaway view of the Elgin Double Check softener and the Double Check system is shown here. The manner in which the system operates is described at right

The action of the double-check strainer used in the upper manifold is shown in the accompanying illustration of the device. Illustration (*A*) shows the double-check strainer in the service position. The lower check valve (*d*) is closed by the flow of the water from the manifold, so that the water cannot pass through the strainer but must follow the course of the arrows, leaving through the open check valve (*c*) and spraying evenly over the zeolite bed. The slotted strainers in the lower manifold permit free flow of water to the service line, yet prevent the escape of zeolite mineral.

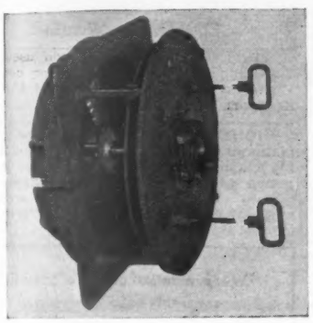
Illustration (*B*) shows the double-check strainer in the backwash position. Here the flow is reversed so that most of the backwash water passes through the strainers and around the now-opened check valve (*d*) to the waste line. The openings in the upper check

valve (*c*) carry a limited predetermined amount of the backwash water with the sediment to the drain, but the remaining backwash water flows through the strainers, gradually reducing the flow of water in that portion of the softener tank between the bottom of the strainers and the top of the strainers.

The "double check" system is used in the new Elgin softeners, but may be applied to softeners already installed as well. According to the manufacturer, the double-check system is the answer to those requring more softening capacity in smaller space from a new softener or increased capacity from existing equipment.

Combination Burner Has Many Attractive New Features

The John Zink Co., Tulsa, announces the designing and manufacture of a new combination gas and oil burner to be known as the Roto-Gas burner. The following features and advantages are claimed for its design and operation:



Eight stationary gas jets with at least ⅛-in. diameter ports; elimination of stuffing boxes, and a relatively small-diameter rotor. Dut to small diameter of rotor, a deposit of sulfur, salt or carbon will have little effect on upsetting the balance. Noise has been eliminated by at least 40 per cent. Hollow center shaft makes possible the installation of an oil burner through the center. Each of the eight gas jets has a separate control cock. When burning oil, steam is used as a motive power and all but two jets cut off, This makes for greater efficiency.

The entire rotor, fan, and shaft are light weight, making it possible to use a light bearing and to move the bearing farther from the heat zone. This enables the air being drawn into the hollow center shaft to effect considerable cooling of the bearing and movable parts. Little time is required to remove or change the gas ports, clean, or change the angle of impact.

The Roto-Gas burner is available in sizes of 17-in. and 23-in. diameters. Even when all working parts are removed the burner still remains a good combination oil and gas burner.

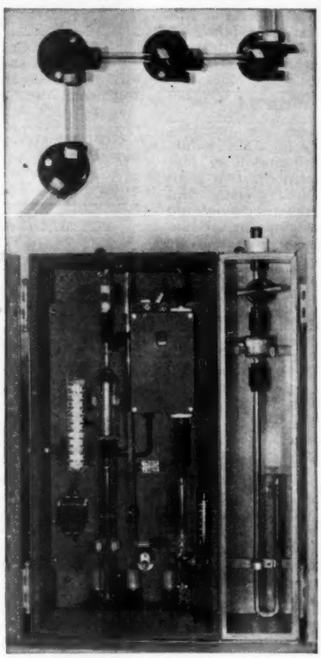
New Plugs Repair Pipe Leaks In Minimum Time

Snap On plugs, made in three sizes, for repairing pipe leaks, have been introduced by the Lithox Corp., Wapakoneta, Ohio. These plugs comes in 1¼-in., 1⅝-in. and 2¼-in. diameter. They can be located any place on the piece of metal or shoe to be clamped to the pipe. By bending the metal strap around the shoe, the plug is made fast; it cannot slip while the workman is inserting the plug in the hole or leak. Then the clamp that pulls the shoe is drawn up tight enough to force the pointed plug into the hole in the pipe. The oil will stop flowing and the metal shoe can be welded to the pipe when convenient.

The plugs are offered in addition to the repair gasket material already produced by the Lithox Corp.

Glass Sampling Line Makes Corrosion Impossible

Heavy-walled glass tubing now brings the continuously flowing flue-gas sample from primary filter to cell assembly, in the Micromax CO_2 recording equipment. Thus, the flue-gas sample comes in contact only with glass from the time it leaves the stack until it leaves the measuring cell. All-glass construction of sampling line and cell assembly entirely eliminates maintenance due to corrosion. Besides eliminating the possibility of corrosion, the clear glass allows instant inspection of the sampling line. Should fly ash pass through the filter and lodge in the line, it can easily be seen and flushed out with water. This sampling line is from Leeds & Northrup Co., 4959 Stenton Avenue, Philadelphia, Pa.



Upper section: Sturdy, thickwalled glass tubing mounted in shock-absorbing clamps carries the flue-gas sample from stack to measuring cell. Lower section: The three-way cock and the condensate drain have also been changed to glass and mounted in a separate compartment

Latin America Dominates Los Angeles Nomad Meeting

Talks by six members recently returned from foreign trips were given at the regular monthly meeting of the Los Angeles chapter of Nomads held in Los Angeles, Calif. Of particular interest was the address by Henry Pullman on the current trends of importance for the American petroleum-equipment industry in relation to the war and South American operations.

Tom Martin spoke on his impressions of conditions in Trinidad, Venezuela, Colombia, Ecuador and Peru and Roland Smith discussed the present activity in the same countries. Tom Murphy told of his trip in the Canadian fields and T. M. Johnston described humorously what happened to him while making his first trip to Trinidad, Venezuela and Colombia.

J. E. Brantly, who has spent much of the last 20 years in various parts of South America, discussed relations between North and South America, pointing out the prospects for wider discovery of oil on the South American Continent and bringing out the desirability of developing other natural resources of that continent and the possibilities for greater trade through proper development of materials which at present are brought into the United States from more distant lands

Among the guests from other countries were Lionel Wiedey of International Petroleum Co., from Talara, Peru; Ed Edwards of the Standard Oil Co. of Venezuela; E. Swanberg of Ecuadorian Oilfields; W. H. A. Dalton of Cia de Petroleo Shell de Colombia; K. Calvert of Burmah Oil Co.; Howard E. Brewen of International Petroleum Co. from Peru; and S. Paul Hart of Mercedes Petroleum Co. from Venezuela.

Changes Announced in Emsco Organization

Announcement of various important changes in the executive department has been made by Hugh H. Glen, president of Emsco Derrick & Equipment Co., effective September 15. William C. Kinder, former manager of some years ago was consolidated with the John J. Griffin & Co. factory into American Meter Co. Since then he has applied himself particularly in the fields of pressure regulation, flow measurement and flow control, and will continue to specialize on this important phase of the company's engineering service.

H. H. GLEN

WM. C. KINDER

J. H. KNECHT

FRANK P. SUMMERS, JR.

the D+B California division, has been appointed assistant to the president. J. H. Knecht has been appointed manager of sales, and Frank P. Summers, Jr., previously Mr. Kinder's assistant, has been advanced to manager of the D+B California division. All three have long been members of the Emsco-D+B organizations and enjoy a wide acquaintance among oil men through many years of association with the petroleum industry.

AMONG EQUIPMENT MEN...

Monsanto Chemical Co. Gives Promotions in Sales Force

Promotion of Arthur P. Kroeger from assistant general branch manager of the Los Angeles, Calif., office of Monsanto Chemical Co. to assistant manager of sales in charge of intermediates, with headquarters in St. Louis, Mo., was announced today by G. Lee Camp, vice president.

Mr. Camp also announced the transfer of Charles L. Fetzner from the San Francisco office of the company to the Los Angeles office as assistant general branch manager to replace Mr. Kroeger.

American Meter Promotes William G. Hamilton, Jr.

American Meter Co. has announced the recent promotion of William G. Hamilton, Jr., to assistant manager of the Philadelphia factory and sales territory. Mr. Hamilton joined the organization December 1, 1927, with the Helme & McIlhenny factory, which

CLASSIFIED ADVERTISING

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Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years Experience
Inquiries Invited
B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

NEW MEXICO
Oil and Gas Leases and Royalties.
ROY G. BARTON, Hobbs, N. M.

EAST TEXAS Woodbine—Trinity sand wildcats starting on Major Company blocks offer quick play 10 to 50 for one bets. E. CROFT, PROCTOR, TEXAS.

THE
OIL PROPERTIES EXCHANGE
For Sale: Many Producing Oil Properties, Royalties, Drilling Blocks, and Oil Investments of various sizes in Mid-Continent area. Contact us to Buy or Sell properties.
Alexander Bldg., Tulsa, Okla.

CRANE COUNTY fee land under Magnolia, Stanolind, leases, Sec. 18, B28. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

FOR SALE

One-half interest in desirable producing property in dolomite area of the Panhandle, Hutchinson County, Texas. Well equipped and operated lease with 27 wells on 320 acres, all productive. Present owner in liquidation solicits inquiry from responsible brokers and operators interested in purchase of production on cash basis. Address

BOX A-680
The Oil and Gas Journal
Tulsa, Okla.

FOR LEASE—159 acres situated Section 7, Township 6 north, Range 27, Beaver County, Oklahoma. S. L. Denhollem, 212 Alta, San Antonio, Texas.

STRUCTURE high. Will give 1000 acres for a test well. John Gerhardt, New Berlin, Illinois.

STAFFORD COUNTY, KANSAS—Leases, block seven eighties, 560 acres, surrounded by major companies, within one half mile production. Independent owner offers at sacrifice price for quick deal. Box A-713, The Oil and Gas Journal, Tulsa, Oklahoma.

BLOCK of leases in Southwestern Oklahoma. Open for deal with parties able to drill well for acreage. Good Geology. Write Philo Dempsey, Roosevelt, Okla.

WILL lease 387 acres ten miles west of Alexandria, La. between two gas wells. Five-year lease $1 per acre, 50c rental. W. B. Belgard, Boyce, La.

OIL DRILLERS ATTENTION: A 2,200 acre oil lease in the FAMOUS LANCE CREEK FORMATION near Lusk, Wyoming, is now available for drilling; the lease is in a proven, producing structure which has been producing oil for more than 20 years. For full details write to W. H. PINE, Faith, S. D.

Leases and Drilling Blocks

FOR SALE — 100-acre farm lease in Hoosier township, Clay County. Write Mrs. Margaret Tolliver, Sailor Springs, Ill.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Situations Wanted

PETROLEUM Engineer, 31, married, B.S. Petroleum Engineering, Mo. School of Mines. Six years with major oil company in responsible positions, two years with oil field tool manufacturing company as consultant. Seeks permanent position with independent or major oil company requiring experienced field engineer who will be required to be able to assume supervisory capacity. Available immediately. Box A-692, The Oil and Gas Journal, Tulsa, Okla.

MECHANICAL ENGINEER, 31, single. Foreman of instrument repair department in large refinery. Experienced in selection and application of new instruments as well as repair of all types. Seven years' refinery experience. Box A-703, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED Gauger desires permanent connection. Age 32, married, 12 years' oil experience, office, billing clerk and gauging. 2 years lease and royalty business. Good mixer, excellent reference. Box A-702, The Oil and Gas Journal, Tulsa, Okla.

REFINERY SUPERINTENDENT, for last 14 years now available. 21 years' experience in skimming, cracking, vacuum distillation, polymerization, asphalt. Age 42, married. Box A-701, The Oil and Gas Journal, Tulsa, Okla.

REFINERY ENGINEER with practical, technical, and operating knowledge desires responsible job with operating company. Box A-710, The Oil and Gas Journal, Tulsa, Okla.

TO OIL Company President Somewhere: Please record my availability for geological work, coastal plain or elsewhere. I am signing off. L. D. Burling, Box 305, Waycross, Ga.

ENGINEER, experienced in design, costs, production scheduling, equipment inspection, technical and legal investigations. Box A-712, The Oil and Gas Journal, Tulsa, Okla.

OIL PROMOTERS: Let me take care of those letters. Years of exp.; $50 week. Room 104, Grande Lodge, Abilene, Texas.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., Tulsa Loan Bldg., Tulsa, Okla.

SUBMIT your Oklahoma, Kansas, Texas, and Louisiana producing royalties. No SEC requirements if preliminary information complete. Address Box A-682, The Oil and Gas Journal, Tulsa, Okla.

OUR READY MARKETS Enable us to pay cash for producing royalty acreage, lots, units and oil payments. GLOBE SECURITIES CO., LTD., Oklahoma City.

WE MAINTAIN A MARKET FOR
REGISTERED DEALERS
IN ALL TYPES OF OIL ROYALTIES

FIRST DEPENDABLE OIL CORP.
522 Fifth Ave., New York, N. Y.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Ranches—Farm Lands

LOUISIANA Farm for sale. Six adjacent counties producing oil. Recently leased for oil or gas for 5 years. 1026 acres of land. Fields fertile, timber (Hard Woods). Lease and ⅛ mineral rights go to buyer. Bisected by paved state highway. 150 miles NW of New Orleans. Reason for wanting to sell is illness. For inquiries, Address A. V. Boutte, Jr., 2536 S. Galvez St., New Orleans, La.

WESTERN RANCHES—500,000 acres, or smaller. State where wanted. No lists. HOWARD INGRAM, Perrine Bldg., Oklahoma City, Okla.

Help Wanted

WANTED
ASPHALT TECHNOLOGIST
Position requires man with technical degree and who has had experience in the manufacture and blending of roofing and paving asphalts. Location, middle West with medium sized oil company. Our employes know of this advertisement. Box A-711, The Oil and Gas Journal, Tulsa, Okla.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CAPITAL SEEKERS
Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

Mailing Lists

ROYALTY owners, Oil investors, Unit holders, Stockholders, Operating personnel of oil industry. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Okla.

Equipment Wanted

WANTED 100,000 ft. of good used 4, 6, 8, 10 and 12 inch pipe, plain or coupled. Write or wire Daniel A. Moritz Co., McKeesport, Pa.

HIGHEST cash prices paid for entire plants or individual production tools, milling machines, shapers, drill-presses, lathes, punch presses, electrical equipment and motors. Write us and a representative will call. COOK COUNTY MACHINERY CO., 1132 W. Lake St., Chicago, Ill.

"When a feller needs a friend!"
WANTED and *NEEDED:*
TANK CARS
Also
STORAGE TANKS or SHELLS
Any kind, quantity or location.
Good prices realizable NOW!
Freight Cars, too.
IRON & STEEL PRODUCTS, Inc.
36 years' experience
13412 S. Brainard Ave., Chicago, Ill.
"ANYTHING containing IRON or STEEL"
Ask to be placed on our various mailing lists and request our popular blue WEAREVER Pencil.

For Sale—Equipment

4—80 HP Type X Bessemer Gas Engines Direct Driven Compressors. Can furnish with 6¼" x 20" to 18" x 20" compressor cylinders. W. S. Smith, 523 Thompson Bldg., Tulsa, Okla., 2-5473.

FOR SALE—Fullers Earth and Clays. Samples Free, Write and give full particulars. M. E. Fisher, Brenham, Texas.

LARGE GASOLINE PLANT
being dismantled. Bessemer equipment, gas engines & other machinery, tanks, towers, regulators, meters, recording gauges, valves, tools, pipe fittings, etc.
GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE: 125 H.P. 200 W.P. Broderick Boiler, Code Condition, $975. Melton Supply Co., Seminole, Okla.

NOTICE OF SALE

Notice is hereby given, in pursuance of an order made and entered by the District Court of Caddo County, Oklahoma on October 8, 1941, that the undersigned Receiver will offer for sale and sell, subject to confirmation of said Court, for cash or upon acceptable terms, the oil refinery plant owned by Cement Refining Company, Inc., and located at Cement, Oklahoma, together with all equipment and machinery appurtenant thereto, and the lease upon which said oil refinery is located. Sealed bids will be received by the Receiver at his place of business in Carnegie, Oklahoma, or at the law office of Oris L. Barney, 126½ West Broadway, Anadarko, Oklahoma, and that said bids will be opened and the sale of said property made to the highest and best bidder therefor, subject to confirmation by the Court, in the District Courtroom, Anadarko, Oklahoma, on Wednesday, October 29, 1941, at ten o'clock A.M. The right to accept or reject any or all bids is expressly reserved.

Dated this 8th day of October, 1941.
MORRIS GOODMAN, RECEIVER,
Cement Refining Co., Inc., a corporation.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL

Tulsa, Oklahoma